



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>





A
PROGRESSIVE COURSE
OF
EXAMPLES IN ARITHMETIC.

LONDON:
R. CLAY, PRINTER, BREAD STREET HILL.

A
PROGRESSIVE COURSE
OF
EXAMPLES IN ARITHMETIC.

BY THE
REV. JAMES WATSON, M.A.
OF CORPUS CHRISTI COLLEGE, CAMBRIDGE,
AND SENIOR MATHEMATICAL MASTER OF THE ORDNANCE SCHOOL, CARSHALTON.



LONDON:
BELL AND DALDY, 186, FLEET STREET.
1855.

181. c. 65.

THE following Work has been drawn up with a view of supplying the want which the Author has felt in his own experience, of a course of Arithmetical Examples, adapted to the use of the more advanced Mathematical Schools, which may be placed in the hands of each pupil, and thereby save the time which is lost in dictating, or otherwise setting Questions to a Class. The Examples were originally prepared for the use of the Ordnance School, at Carshalton; but the Author has been induced to offer them generally to the public, in the hope that they may prove useful to others, who have experienced the same want as himself.

Many of the Examples in the following pages are original, whilst many others have been selected from the Cambridge, and Military, and other public Examination Papers.

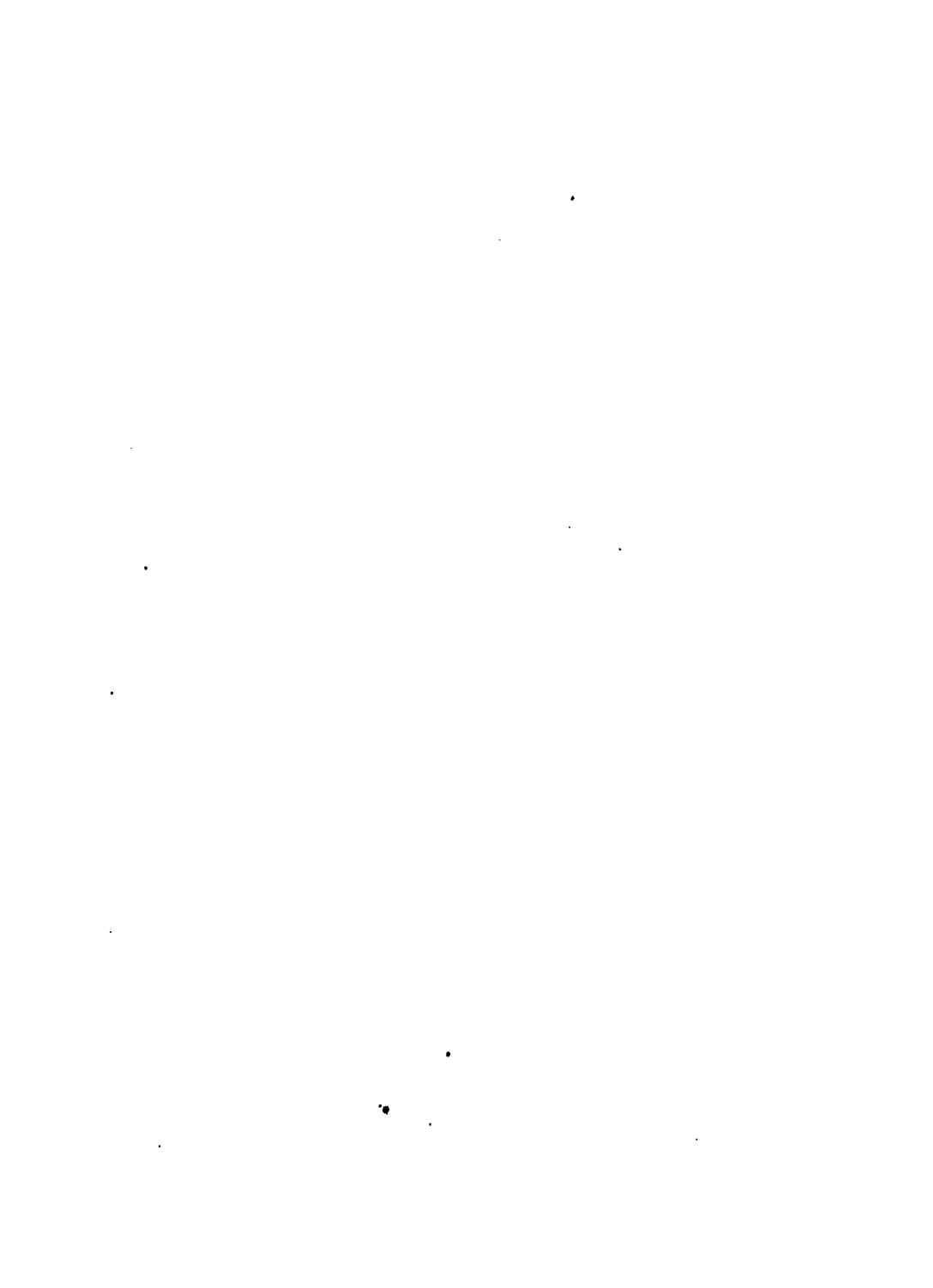


TABLE OF CONTENTS.

Ex.	Page
I. Numeration	1
II. Notation	1
III. Simple Rules	2
IV. Reduction	3
V. Compound Addition and Subtraction	4
VI. Compound Multiplication	5
VII. Compound Division, Case I.	6
VIII. " " Case II.	7
IX. Miscellaneous Examples	7
X. Greatest Common Measure	13
XI. Least Common Multiple, Case I.	13
XII. " " Case II.	14

VULGAR FRACTIONS :—

XIII. Reduction of Fractions to their Lowest Terms	14
XIV. Reduction of Mixed Numbers	15
XV. Reduction of Improper Fractions	15
XVI. Reduction of Fractions to their Least Common Denominator	15
XVII. Reduction of Compound Fractions	15
XVIII. Addition	16
XIX. Subtraction, Case I.	17
XX. " Case II.	17
XXI. Multiplication	18
XXII. Division	18
XXIII. Simplification of Mixed Fractional Expressions	18
XXIV. Valuation of Concrete Fractions	22
XXV. To express one Quantity in Terms of another	23
XXVI. Miscellaneous Examples in Fractions	24

DECIMAL FRACTIONS :—

XXVII. Addition	28
XXVIII. Subtraction	28

Ex.	Page
XXIX. Multiplication	28
XXX. Division	29
XXXI. Reduction of Vulgar Fractions to Decimals	30
XXXII. Reduction of Decimals to Vulgar Fractions	30
XXXIII. Addition of Recurring Decimals	31
XXXIV. Subtraction of Ditto	31
XXXV. Multiplication of Ditto	32
XXXVI. Division of Ditto	32
XXXVII. Valuation of Concrete Decimals	33
XXXVIII. To express one quantity as a Decimal of another	34
XXXIX. Miscellaneous Examples in Decimals	35
XL. Practice, Case I.	38
XLI. „ Case II.	38
XLII. Simple Proportion	40
XLIII. Compound Proportion	44
XLIV. Proportional Parts	47
XLV. Inverse Proportion	49
XLVI. The Chain Rule	51
XLVII. Interest, Case I.	52
XLVIII. „ Case II.	53
XLIX. „ Case III.	54
L. Discount	56
LI. Stocks	57
LII. Profit and Loss	60
LIII. Areas and Volumes	62
LIV. Square Root	66
LV. Cube Root	66
LVI. Miscellaneous Examples in Evolution	67

EXAMPLES IN ARITHMETIC.

NUMERATION.

EXERCISE I.—Express the following in words :

- | | |
|------------------------|------------------------------|
| 1. 10010000101. | 9. 7060052100710431008. |
| 2. 1785600001. | 10. 21003000712003047800. |
| 3. 600000201. | 11. 1050320098105007036. |
| 4. 700020020. | 12. 50040070030685009120. |
| 5. 30900010103004. | 13. 8513078400061300180190. |
| 6. 200002000200101. | 14. 64201890005070003218. |
| 7. 1978600050010001. | 15. 8250746200078543012. |
| 8. 100200030040500600. | 16. 90807060650040300020100. |

NOTATION.

Ex. II

Write the following in figures :

1. Seven hundred and twenty-six.
2. Seven thousand and twenty-six.
3. Seventy thousand two hundred and six.
4. Ninety billions one million two thousand and seventy.
5. Six thousand billions eight millions and three thousand.
6. Three hundred trillions seventy millions and eighty.
7. One hundred thousand trillions sixteen thousand millions.
8. Five hundred and nine millions six thousand and one.
9. Four trillions four thousand millions and forty.
10. Twenty thousand billions two hundred thousand.
11. One hundred and six billions eighty thousand and forty millions
nine hundred and two thousand and fifty.
12. Seven thousand billions thirty-two thousand and five millions
twelve thousand and ten.
13. Thirteen thousand billions six thousand four hundred millions
eleven thousand and five.

14. Twenty-five trillions eighteen thousand billions sixty-five millions forty thousand and seventeen.

15. One hundred trillions eight hundred thousand and two billions eighty-seven thousand and nineteen millions thirty thousand and twenty-one.

16. Two thousand and fifty-six trillions fourteen thousand and seventy billions five hundred thousand three hundred and two millions nine hundred thousand six hundred and thirteen.

SIMPLE RULES.

Ex. III.

1. Add together 17856403, 204507819, and 35000704.
2. Subtract 7836289 from 8765427.
3. Add together 145796 and 2358479, and subtract 1875469 from the result.
4. Multiply 98756 by 35724.
5. Multiply 246800745 by 9999.
6. Multiply 684010875 by 49999.
7. Find the continued product of 2875, 3259, and 1674.
8. Multiply the sum of 928374650 and 928311860 by their difference.
9. What will be the quotient and remainder when 3207140086281 is divided by 84 by short division?
10. Divide 7890567 by 42, first by long division, and secondly by its factors 6 and 7.
11. Multiply 238957 by 406509, and divide the product by 135503.
12. Divide 1708058240940 by 4567, and prove the operation.
13. Divide 1101948236 by 2974, and prove the result.
14. Divide 5509746097 by 1472, and prove the result.
15. Divide 25105170684379 by 5021, and prove the result.
16. Multiply forty thousand five hundred and twenty-eight millions seven hundred and six thousand seven hundred and nine, by fifty-three thousand millions eighteen thousand and ninety-seven.
17. Multiply seven millions nine thousand and seven, by three millions fifty thousand seven hundred; and divide the product by one million sixteen thousand nine hundred.
18. Multiply seven millions ninety-one thousand and eight by four millions fifty-two thousand and seventy; and divide the product by thirty-six thousand eight hundred and thirty-six.

19. Multiply ten millions thirty-eight thousand and forty-eight, by one million fifteen thousand; and divide the product by one hundred and twenty-six thousand eight hundred and seventy-five.

20. What number divided by 48762 will give 6285 for quotient and 26108 for remainder?

21. What number multiplied by 265 will give 1490097385 for the product?

22. Find that number which when divided by 90009 gives 746115 for a quotient, with 83337 for a remainder?

23. The product is 26299989276, and the multiplicand is 800706; what is the multiplier?

24. If the dividend be 21810149152, and the quotient be 39314; what is the divisor?

25. The Moon's distance from the Earth is two hundred and forty thousand miles, and the Sun's ninety-five millions of miles; how much is the Sun farther from the Earth than the Moon?

REDUCTION.

Ex. IV.

1. Reduce £8275 13s. 6½d. to farthings.
2. How many groats are there in £60172 13s. 4d.?
3. Find how many threepenny pieces are contained in £9475 18s. 9d.?
4. In £10728 12s. 6d. how many half-crowns, sixpences, and three-farthing pieces are there?
5. In 4 tons, 6 cwt. 2 qrs. 17 lbs. 9 oz., how many ounces?
6. How many square yards are there in a field 10 acres, 2 roods, 3 poles in area?
7. Find the number of inches in 5 miles, 6 furs. 22 yds.
8. Reduce 6 miles, 3 furs., 25 poles, 3½ yds., 6 in. to inches.
9. How many seconds are there in 1 day, 5 hrs. 48 mins. 30 secs.?
10. How many farthings are there in 3 sovereigns, 3 half-sovereigns, and 3 half-crowns?
11. How many days, hours, minutes and seconds, are there in 1178825 seconds?
12. How many tons, cwts., qrs., and lbs., are there in 19692175 lbs.?
13. Reduce 4203239040 cubic inches to cubic yards.

14. How many tons, cwt., &c., are there in 97664 ounces avoirdupois?
15. Find the number of cubic yards in 139968 cubic inches; the number of square yards in the same number of square inches; and the number of lineal yards in the same number of lineal inches?
16. How many seconds will have passed from the birth of Christ before the beginning of April, 1856?

COMPOUND ADDITION AND SUBTRACTION.

Ex. V.

1. Add together £1037 13s. 5d.; £56 5s. 2d.; £712 0s. 3½d.; £1123 19s. 5½d.
2. Subtract £3562 19s. 7d. from £4571 13s. 2d.; and verify the result.
3. From £3251 11s. 7d. take £2615 13s. 9d., and prove the result.
4. Add together £3248 9s. 8d. and £456 5s. 2d., and subtract from the result £591 17s. 11d.
5. Add together 10 yds. 1 ft. 9 in.; 7 yds. 2 ft. 4 in.; 18 yds. 1 ft. 5 in.
6. Find the sum of 12 yds. 3 qrs. 3 nls.; 7 yds. 2 qrs. 1 nl.; 37 yds. 1 qr. 2 nls.
7. Find the sum of 723 tons, 14 cwt. 2 qrs. 15 lbs.; 24 tons, 8 cwt. 1 qr. 23 lbs.; 584 tons, 17 cwt. 3 qrs. 8 lbs.; 1 cwt. 27 lbs.; 15 tons, 3 qrs.
8. Find the sum of 1076 lbs. 11 oz. 18 dwts. 23 grs.; 142 lbs. 1 oz. 7 dwts. 14 grs.; 63 lbs. 9 dwts. 6 grs.; 48 lbs. 16 grs.; 1 lb. 1 oz. 2 dwts. 2 grs.
9. Find the sum of 16 lbs. 8 oz. 7 drs. 2 scrs. 15 grs.; 201 lbs. 1 oz. 6 drs. 1 scr. 19 grs.; 11 lbs. 11 oz. 3 drs. 2 scrs. 18 grs.
10. Required the sum of 47 yrs. 67 ds. 12 hrs. 11 mins. 23 secs.; 1021 yrs. 154 ds. 47 hrs. 18 mins. 42 secs.; 11 yrs. 219 ds. 35 mins. 57 secs.
11. Required the sum of 75 acres, 2 roods, 18 poles; 4823 ac. 3 ro. 39 po.; 1165 ac. 1 ro. 34 po.; 23 ac. 3 ro. 19 po.
12. Add together 27 qrs. 5 bus. 3 pks. 1 gal.; 803 qrs. 7 bus. 2 pks.; 8 qrs. 2 bus. 1 pk. 1 gal.; 16 qrs. 4 bus. 2 pks. 1 gal.
13. What is the difference between 4276 cub. yds. 16 cub. ft. 1084 cub. in., and 809 cub. yds. 23 cub. ft. 1523 cub. in.
14. Subtract 2006 tons, 17 cwt. 2 qrs. 24 lbs. 13 oz. 13 drs. from 3384 tons, 3 cwt. 3 qrs. 17 lbs. 15 oz. 11 drs., and verify the result.
15. A clock has its face marked so as to show 24 hours in a day,

and on a certain evening, half an hour after sunset, it was set at 24 o'clock. The following morning it was 4 minutes past 8, when by a common clock it was 8 minutes past 4. Find the time of sunset the previous evening.

COMPOUND MULTIPLICATION.

Ex. VI.

1. Multiply £55 17s. 4½*d.* by 12.
2. ... £5627 1s. 2¼*d.* by 64.
3. ... £2915 4s. 2¼*d.* by 13.
4. ... £3761 16s. 2½*d.* by 459.
5. ... £327 8s. 5¼*d.* by 567.
6. ... £964 19s. 8¼*d.* by 674.
7. ... £4006 18s. 10½*d.* by 668.
8. ... £837 14s. 8½*d.* by 746.
9. ... £763 13s. 7¼*d.* by 875.
10. ... £989 10s. 7¼*d.* by 3276.
11. ... £569 13s. 9½*d.* by 7982.
12. ... £987 15s. 9¼*d.* by 7392.
13. ... £887 14s. 11*d.* by 6967.
14. ... £976 7s. 5½*d.* by 5809.
15. ... £738 11s. 7½*d.* by 6495.
16. ... £809 19s. 8¼*d.* by 7089.
17. ... £874 9s. 5*d.* by 3849.
18. ... £995 13s. 8¼*d.* by 4967.
19. ... £787 19s. 7½*d.* by 4697.
20. ... £989 18s. 10¼*d.* by 9809.
21. ... £1008 9s. 2¼*d.* by 1803.
22. ... £3708 9s. 10¼*d.* by 1398.
23. ... £270 1s. 4½*d.* by 6435.
24. ... 139 lbs. 9 oz. 2 dwts. 9 grs. by 166.
25. ... 927 lbs. 3 oz. 11 dwts. 6 grs. by 342.
26. ... 237 tons, 5 cwt. 0 qrs. 14 lbs. by 564.
27. ... 2 cwt. 3 qrs. 25 lbs. 1 oz. by 73.
28. ... 144 miles, 5 furs. 34 poles, 1 yd. by 213.
29. ... 17 wks. 6 ds. 6 hrs. 42 mins. by 113.
30. ... 13 acres, 2 roods, 17½ poles, by 213.

COMPOUND DIVISION.

EX. VII.—CASE I.

1. Divide £389 11s. 7d. by 7.
2. ... £467 12s. 3½d. by 9.
3. ... £8451 3s. 5½d. by 8.
4. ... £2467 15s. 10½d. by 100.
5. ... £10873 7s. 7½d. by 300.
6. ... £20654 12s. 4¾d. by 56.
7. ... £85320 1s. 8¼d. by 81.
8. ... £92103 17s. 1½d. by 144.
9. ... £180078 0s. 7½d. by 125.
10. ... £201096 1s. 0½d. by 441.
11. ... £46789 16s. 11½d. by 504.
12. ... £96835 18s. 10¼d. by 397.
13. ... £49865 15s. 10¾d. by 596.
14. ... £36948 19s. 11¼d. by 948.
15. ... £29654 0s. 0¾d. by 375.
16. ... £68596 16s. 0½d. by 869.
17. ... £87629 18s. 10¼d. by 987.
18. ... £48962 16s. 6¾d. by 698.
19. ... £696485 2s. 9¾d. by 765.
20. ... £394695 6s. 3¼d. by 399.
21. ... £2017358 12s. 8¾d. by 9678.
22. ... £375326 14s. 4½d. by 7735.
23. ... £5620087 10s. 6¼d. by 6427.
24. ... £920687 2s. 6½d. by 5278.
25. ... £1076429 1s. 10¾d. by 2109.
26. ... £871324 9s. 11½d. by 3333.
27. ... £46854 9s. 8½d. by 1187.
28. ... £689435 18s. 10¼d. by 4763.
29. ... £946394 16s. 0¼d. by 2698.
30. ... £964697 0s. 11¼d. by 9876.
31. ... 57915 lbs. 3 oz. 10 dwts. 12 gra. by 606.
32. ... 2959 lbs. 2 oz. 12 dwts. 10 grs. by 406.
33. ... 19116 tons, 1 cwt. 2 qrs. by 564.
34. ... 25808 cwt. 2 qrs. 2 lbs. 14 oz. by 338.
35. ... 6859 miles, 7 furs. 36 po. 4 yds. 2 ft. 8 in. by 756.

36. Divide 9468 miles, 3 furs. 29 po. 5 yds. 1 ft. 6 in. by 987.
37. ... 1884742 acres, 2 roods, 15 poles, by 705.
38. ... 121260 cub. yds. 22 cub. ft. 392 cub. in. by 584.
39. ... 5968 wks. 5 ds. 18 hrs. 57 mins. 46 secs. by 789.
40. ... 6948 yrs. 6 ms. 3 wks. 6 ds. 14 hrs. 56 mins. 54 secs. by 675.

Ex. VIII.—CASE II.

1. Divide £10683 14s. 2½d. by £42 11s. 3½d.
2. ... £70639 12s. 4d. by £7 10s. 0½d.
3. ... £410677 13s. 6½d. by £41 1s. 5½d.
4. ... £240037 8s. 6½d. by £57 4s. 1½d.
5. ... 3418 cwt. 3 qrs. 6 lbs. 14 oz. by 3 cwt. 3 qrs. 6 lbs. 14 oz.
6. ... 4108 tons, 4 cwt. 1 qr. 24 lbs. by 6 tons, 9 cwt. 1 qr. 16 lbs.
7. ... 5608 lbs. 10 oz. 8 dwts. by 13 lbs. 8 oz. 19 dwts. 8 grs.
8. ... 4167 qrs. 2 bus. 1 pk. 1 gal. by 7 qrs. 3 bus. 2 pks. 1 gal.
9. ... 8697 bus. 2 pks. by 15 bus. 1 pk. 0 gals. 2 qts.
10. ... 7209 days, 22 hrs. 48 mins. 12 secs. by 7 days, 11 hrs. 30 mins. 3 secs.

N.B.—The results in Exercises VII. and VIII. should be verified by Multiplication.

MISCELLANEOUS EXAMPLES.

Ex. IX.

1. How many pounds, shillings, and pence are there in 13 guineas, 25 half-crowns, 17 florins, and 19 groats?
2. How long would it take to count £780,000,000, the amount of the National Debt, at the rate of £100 per minute?
3. How many dollars are there in £289 17s., at 4s. 3d. per dollar?
4. If a wheel makes 64640 revolutions in passing over 202 miles, what is its circumference?
5. If 1000 sovereigns weigh 21 lbs. 5 oz. 16 dwts. 6 grs., what is the weight of one sovereign?
6. The length of the quick-march step is 30 inches, 108 of which go to the minute; at what rate per hour is that?
7. The pressure of the atmosphere on every square inch of surface is 15 lbs.; find the pressure upon the superficies of the human body, supposing it to be equal to 14 square feet.

8. If a sheet of paper, $5\frac{1}{2}$ feet long by $2\frac{1}{2}$ feet broad, be cut into strips 1 inch broad ; how many sheets would be required to form a strip that would reach round the Earth (25000 miles) ?

9. Sound travels at the rate of 1142 feet in a second ; if, after a flash of lightning is seen, $4\frac{1}{4}$ minutes elapse before the thunder is heard, how far is the storm distant ?

10. Light travels at the rate of 192268 miles in a second ; find how long a ray of light is in coming from the Sun to the Earth, a distance of 95,000,000 miles ?

11. In £714 17s. $5\frac{3}{4}$ d., how many crowns, half-crowns, threepenny pieces, and threefarthing pieces ?

12. If a person lay by £19 12s. 6d. out of a yearly income of £120, how much does he spend per day ?

13. How many pounds are there in 3 cwt. 3 qrs. 27 lbs. ? Also, how many parcels each 10 lbs. 4 oz. can be made up of the same weight ?

14. What is the value of 2475 yards of cloth, at 13s. $10\frac{1}{2}$ d. per yard ? Also, how many coins, worth 1s. $6\frac{1}{2}$ d. each, would pay for it ?

15. A gentleman spends daily £1 7s. $10\frac{1}{2}$ d., and at the year's end lays by £340 ; what is his yearly income ?

16. Find the circumference of a wheel which makes 16160 revolutions in passing over $25\frac{1}{4}$ miles.

17. What is the value of 1 ton, 8 cwt. $8\frac{1}{2}$ lbs., at 5d. for $1\frac{1}{4}$ lbs. ?

18. A grocer bought 3 chests of tea, which weighed together 7 cwt. 1 qr. 17 lbs. ; one of them weighed 22 lbs. more than either of the others ; what were their respective weights ?

19. At a certain election 3750 persons voted, and the successful candidate had a majority of 910 ; how many voted for each ?

20. A person distributed 120 shillings among 100 persons, giving to some of them 9d. each, and 15d. to each of the remainder ; how many received 15d. ?

21. One day's wages of 240 labourers, some receiving 12d. each, and others 16d. each, amounted to £15 ; how many received 12d. and how many 16d. ?

22. *A* owes to *B* one hundred and eleven half-guineas ; to *C* fifty-three crowns ; to *D* three hundred and twenty dollars at 4s. 6d. each ; to *E* fifteen hundred half-crowns ; to *F* two hundred and fifty francs at $10\frac{1}{2}$ d. each ; to *G* one thousand and twenty-seven half-pence : what is the amount of *A*'s debt ?

23. If 29040 copies of a book be printed, each copy consisting of 3

sheets, and each sheet occupying 7 square feet in size; how many acres will one edition cover?

24. Prize money to the amount of £103368 16s. 10½*d.* is to be divided amongst 5793 men; what will be each man's share?

25. Divide 2468 rods, 8 poles, 26 yds. 3 ft. by 33, and prove the result by Multiplication.

26. The price paid for a silver salver, weighing 6 lbs. 6 oz., was £33 16s.; the duty was 1s. 6*d.* per oz., and the workmanship 1s. 9*d.* per oz.; what was the price of the silver per oz.?

27. In 5146 pieces of money each 17s. 3¼*d.*, as many more each 4s. 3¼*d.*, and as many more each 1s. 7¼*d.*, how many Napoleons each 16s. 7¾*d.*?

28. A great-coat costs £1 5s., a hat 17s. 6*d.*, a pair of shoes 6s. 8*d.*, and a pair of socks 9*d.*; what is the cost of supplying a regiment of 999 men with a coat and hat, and two pairs of shoes and socks, apiece?

29. In 4176 pieces of money each 11s. 6*d.*, as many more each 4s. 9½*d.*, and as many more each 3s. 7*d.*, how many dollars each 5s. 4½*d.*?

30. Out of 748 parcels of tea, each weighing 2 qrs. 15 lbs., and as many more 1 cwt. 0 qrs. 17 lbs. each; how many parcels could be made 7 cwt. 2 qrs. 8 lbs. each?

31. A tenant holds a farm of 350 acres, subject to a tax of 3s. 6*d.* per acre, and a corn-rent of 100 quarters of wheat, barley, oats, and beans, respectively. Find the amount of his rent, when the average prices of wheat, barley, oats, and beans, per quarter, are 38s. 9*d.*, 27s. 4*d.*, 17s. 4*d.*, and 33s. 10*d.*, respectively.

32. If each inmate of a workhouse cost per week 2s. 2¼*d.* for food, 5¼*d.* for clothes and washing, and 3*d.* for lodging, and the number of persons thus maintained be estimated at 100000; what is the whole yearly cost, and how many labourers, at 18*d.* a-day wages, would earn the same sum in the same time?

33. There is a chain 22 yds. 0 ft. 3 in., which is contained exactly 266 times in a certain distance; and also another, which is only contained 265 times in the same distance. Find the distance in miles, furlongs, &c., and also the difference between the two chains.

34. How many parcels of 3½ lbs. troy are there in 11 cwt. 1 qr. 20 lbs. avoirdupois?

35. A captain and 160 sailors took a prize worth £1547 18s. 4*d.*, of which the captain had ⅓th for his share, and the rest was equally divided amongst the sailors; what was each man's share?

36. A clerk in the receipt of £120 a-year, is charged an income-tax at the rate of $5d.$ in the pound; by how much is his income diminished? And supposing that at the time this tax is imposed duties are repealed, so that tea (of which he consumes $1\frac{1}{2}$ lbs. a month) becomes $9d.$ a lb. cheaper, and soap (of which he consumes 40 lbs. a year) $1\frac{1}{2}d.$ a lb. cheaper; is he a gainer or loser by the change, and by how much?

37. If £100 be distributed to wounded soldiers, $\frac{2}{3}$ to privates at $4s. 2d.$ each, and $\frac{1}{3}$ to corporals at $6s. 8d.$ each; amongst how many men will it be divided?

38. A master and 72 men dug up together 9040 ounces of gold; supposing the price of gold to be £3 2s. $7\frac{1}{2}d.$ per ounce, and that the master had $\frac{1}{3}$ th for his share, whilst the rest was equally divided among the men, what was each man's gain?

39. A person who spends on an average $8s. 7\frac{1}{2}d.$ per day, discovers at the end of the year that he has exceeded his income by £7 15s. $8\frac{3}{4}d.$; what is his annual income, and by how much must he diminish his daily expenditure so as to compensate for the deficiency by the end of the next year (which is leap-year)?

40. In a detachment of troops, consisting altogether of 1260 men, one-third part were cavalry; but after receiving a reinforcement of infantry, one-fifth part only of the increased detachment were cavalry; what was the strength of the reinforcement?

41. A stationer buys 36 reams of paper at $16s. 6d.$ per ream, and 84 reams at $17s. 9d.$ per ream; find his entire outlay, and the average price per ream.

42. Among how many men must £73 be divided, in order that the share of each may be £4 17s. $4d.$? And among how many must £79 17s. $6d.$ be divided, in order that half of them may have $10s. 7d.$ each, and the other half $7s. 2d.$ each?

43. Three-fifths of a certain number of persons received $5s. 2d.$ each, and the rest received $3s. 8d.$ each; the whole sum divided was £205 10s.; how many persons were there?

44. A farmer pays in wages every week £22 10s.; to each man he pays $12s. 6d.$, and to each boy $5s.$; he employs twice as many men as boys; how many of each are there?

45. Rations of 6 lbs. 8 oz. and 10 lbs. 3 oz., in the ratio of 5 of the former to 4 of the latter, are to be cut out of 147 cwt. 3 qrs. $6\frac{1}{2}$ lbs. of beef; how many of each sort will there be?

46. A bag contains a certain number of sovereigns, 3 times as many

shillings, and 4 times as many pence, and the whole sum in the bag is £280; find how many sovereigns, shillings, and pence it contains respectively.

47. There are in a manufactory a certain number of workmen who receive 50s. a week; twice as many who receive 31s. 6d. a week, and 11 times as many who receive 14s. a week; and the total amount of the workmen's wages for one week is £93 9s.; find the number of workmen.

48. At a certain public meeting, at which there were 6 ladies present to every 5 gentlemen, a subscription was made for a certain purpose, each gentleman contributing 7s. 6d. and each lady 5s.; the whole sum collected was £756; how much money was subscribed by ladies, and how much by gentlemen?

49. If £433 7s. be paid in crowns, half-crowns, shillings, and six-pences, in equal numbers, how many coins of each species will there be?

50. If the toll-keeper at Waterloo Bridge received in one day £36 5s. 8d.; omnibuses paying 4d., cabs 2d., ridden horses 1d., and foot-passengers $\frac{1}{2}$ d. each; whilst for every omnibus there passed 2 ridden horses, 6 cabs, and 20 foot-passengers; find how many of each passed in the day.

51. Two-thirds of a certain number of persons received eighteen pence each, and one-third received half-a-crown each; if the whole sum distributed was £2 15s., how many persons were there?

52. Divide £11 5s. 10d. between three persons in such a manner that one of them shall receive three times as much as either of the others.

53. In the allied army of 150,000 men, there are 6 French to every 5 English, 5 English to every 4 Turks, and 4 Turks to every Sardinian; how many are there of each?

54. The price of a season ticket to the Great Exhibition of 1851, was for ladies two guineas, and for gentlemen three guineas; now if on any given day the gentlemen's tickets disposed of were twice as many as the ladies' tickets, and the whole sum received £840, how many tickets were sold on that day?

55. At a public ball there were 6 gentlemen to 5 ladies; the gentlemen's tickets were $1\frac{1}{2}$ guineas each, and the ladies' 1 guinea each; the net proceeds, after deducting £470 for expenses, were £1000; how many ladies and gentlemen were there?

56. If 100 quarters of wheat are sold for 77s. 8d. per quarter, and 50 quarters for 78s. 3d. per quarter, what is the average price per bushel?

57. A person's average annual expenditure from the year 1830 to the year 1850 inclusive, is £391 9s. 2d.; he finds that in 1830 he spent £391 16s. and that in 1851 he spent £445 8s. 9d.; what was his average annual expenditure from 1831 to 1851 inclusive?

58. A poulterer sold

17½	brace of partridges,	at	4s. 9½d.	per brace;
13½	... pheasants,	at	7s. 9d.	...
16½	... widgeon,	at	6s. 7d.	...
11½	... ptarmigan,	at	5s. 6d.	...
19½	... plovers,	at	2s. 8½d.	...
9½	... grouse,	at	8s. 9d.	...
13½	dozens of pigeons,	at	15s. 6d.	per dozen;
23½	couples of guinea fowls,	at	2s. 9½d.	each.

Find the whole sum realised, and the average price per bird.

59. A clerk having to pay 1000 workmen £1 5s. 4½d. each, receives from his employer £1000 for this purpose, and this, together with £9 18s. 6d. of his own, he expends in paying each man in full as far as the money goes; how many men remain unpaid?

60. The price of a book which comes out in parts is £2 6s. 8d.; but if the price of each part were 13d. more than it is, the price of the book would be £3 7s. 6d.; how many parts are there?

61. A man buys 25 sheep for £36, and 30 more for £46; what will he gain or lose by selling them at £1 10s. 6d. apiece?

62. A farmer buys 100 cattle at £9 each; and after feeding off 60 acres of turnips, and giving them £150 worth of hay, he sells them again at £15 each; how much does he make per acre by his turnips?

63. A merchant bought 714 gallons of rum at 11s. 1d. per gallon; and after mixing with it 100 gallons of rum at 12s. per gallon, and 100 gallons of water, he retailed the whole at 2s. 11d. per quart; how much did he gain by this transaction?

64. A wine-merchant bought 63 gallons of brandy for £67 14s. 6d., and then added 7 gallons of water; at what price per gallon must he sell the mixture so as to gain £15 8s. by the transaction?

65. If I send to a merchant abroad 267 tons 19 cwt. of iron work worth £12 per ton, and he returns me 3113 gallons of wine worth

13s. $2\frac{1}{2}$ d. per gallon; how much money does he still owe me on that account?

66. A grocer expended £1540 in the purchase of a certain quantity of tea at 3 cwt. for £70, and twice as much at 3 cwt. for £80; if he retail the whole at the rate of 6 cwt. for £150, what will he gain or lose?

GREATEST COMMON MEASURE.

Ex. X.

Find the Greatest Common Measure of—

- | | |
|---------------------------|-------------------------------------|
| 1. 336 and 1736. | 11. 1407, 3015, and 4020. |
| 2. 2075 and 11390. | 12. 6831, 5967, and 4692. |
| 3. 2982 and 2765. | 13. 8277, 10947, and 11303. |
| 4. 31137 and 14065. | 14. 5187, 5850, and 1339. |
| 5. 47005 and 14433. | 15. 3384, 8272, and 7567. |
| 6. 3888 and 5572. | 16. 62527, 57815, and 30318. |
| 7. 236511 and 37499. | 17. 15768, 16644, and 36865. |
| 8. 21672 and 24060. | 18. 18, 96, 120, and 3720. |
| 9. 133767 and 219207. | 19. 8787, 11658, 15022, and 20648. |
| 10. 8185736 and 20578792. | 20. 32136, 24245, 12051, and 16445. |

LEAST COMMON MULTIPLE.

Ex. XI.—CASE I.

Find the Least Common Multiple of—

1. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12.
2. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20.
3. 8, 9, 12, 15, 16, 20, 27.
4. 120, 140, 168, 210.
5. 26, 28, 30, 32, 34, 36, 39.
6. 9, 10, 11, 12, 13, 14, 15, 16.
7. 3, 7, 9, 15, 36, 40, 63.
8. 48, 81, 32, 28, 44, 110, 165.
9. 2, 5, 8, 15, 18, 24, 36, 54.
10. 4, 9, 11, 36, 48, 56, 144.
11. 17, 22, 25, 33, 85, 136, 187.
12. 16, 20, 24, 30, 72, 100, 125.

EXAMPLES IN ARITHMETIC.

13. 7, 11, 42, 27, 90, 154, 720.
14. 250, 360, 49, 700, 135, 560.
15. 21, 12, 6, 7, 48, 28, 63.
16. 24, 105, 180, 96, 336, 84.

EX. XII.—CASE II.

Find the Least Common Multiple of—

- | | |
|---------------------------|------------------------------------|
| 1. 5115 and 8415. | 13. 4864, 15616, and 1904. |
| 2. 23997 and 6327. | 14. 4410, 7350, and 7875. |
| 3. 273, 325, and 364. | 15. 2835, 4680, and 66040. |
| 4. 819, 832, and 858. | 16. 10302, 10403, and 10506. |
| 5. 756, 814, and 935. | 17. 2231, 2425, and 2775. |
| 6. 288, 504, and 792. | 18. 11934, 12852, and 13804. |
| 7. 552, 575, and 675. | 19. 6097, 9737, and 7169. |
| 8. 972, 1826, and 2057. | 20. 312, 408, 285, and 345. |
| 9. 5184, 6912, and 3456. | 21. 1333, 1829, 3348, and 15222. |
| 10. 5325, 8307, and 3775. | 22. 1610, 6555, 1978, and 17157. |
| 11. 5865, 7429, and 7695. | 23. 3007, 2573, 4067, and 56357. |
| 12. 6831, 5967, and 4692. | 24. 225, 255, 1023, 289, and 4095. |

25. Find the least number of pounds which can be paid in either half-crowns or guineas.

VULGAR FRACTIONS.

EX. XIII.—REDUCTION OF FRACTIONS TO THEIR LOWEST TERMS.

Reduce—

1. $\frac{209}{380}$	7. $\frac{4123}{351386}$	13. $\frac{428108}{586749}$
2. $\frac{1344}{1536}$	8. $\frac{19557}{156933}$	14. $\frac{147785}{176990}$
3. $\frac{2993}{3321}$	9. $\frac{96085}{113555}$	15. $\frac{10244}{103288}$
4. $\frac{6327}{23997}$	10. $\frac{120916}{133968}$	16. $\frac{16287}{67818}$
5. $\frac{13786}{93208}$	11. $\frac{108338}{119742}$	17. $\frac{10767}{203021}$
6. $\frac{6902}{8265}$	12. $\frac{286714}{999999}$	18. $\frac{519176}{692671}$

Ex. XIV.—REDUCTION OF MIXED NUMBERS.

Reduce to Improper Fractions :

1. $1\frac{13}{24}$	5. $5\frac{27}{24}$	9. $492\frac{2}{3}$
2. $4\frac{23}{210}$	6. $8\frac{51}{112}$	10. $3491\frac{2}{3}$
3. $2\frac{143}{168}$	7. $3\frac{247}{336}$	11. $5270\frac{48}{171}$
4. $5\frac{7}{180}$	8. $6\frac{113}{967}$	12. $1954\frac{184}{237}$

Ex. XV.—REDUCTION OF IMPROPER FRACTIONS.

Reduce to Mixed Numbers :

1. $\frac{210}{107}$	5. $\frac{3327}{212}$	9. $\frac{13183}{116}$
2. $\frac{168}{143}$	6. $\frac{20765}{546}$	10. $\frac{223778}{467}$
3. $\frac{5832}{1885}$	7. $\frac{61177}{1035}$	11. $\frac{2830407}{1364}$
4. $\frac{43260}{4783}$	8. $\frac{616979}{7013}$	12. $\frac{6609878}{7369}$

Ex. XVI.—REDUCTION OF FRACTIONS TO THEIR LEAST COMMON DENOMINATOR.

Reduce to their Least Common Denominator :

1. $\frac{7}{12}, \frac{5}{8}, \frac{4}{3}, 2, \frac{5}{6}$.	6. $\frac{11}{10}, \frac{18}{20}, \frac{23}{20}, \frac{43}{20}, \frac{17}{11}$.
2. $\frac{3}{8}, \frac{1}{12}, \frac{4}{3}, \frac{7}{20}, 6$.	7. $\frac{7}{12}, \frac{1}{16}, \frac{2}{21}, \frac{11}{60}, \frac{23}{28}$.
3. $\frac{7}{18}, \frac{10}{21}, \frac{16}{36}, \frac{11}{12}, \frac{2}{3}$.	8. $\frac{5}{8}, \frac{3}{8}, \frac{1}{2}, \frac{7}{12}, \frac{1}{4}$.
4. $\frac{2}{3}, \frac{4}{18}, \frac{16}{10}, \frac{50}{21}, 1$.	9. $\frac{3}{14}, \frac{13}{18}, \frac{17}{70}, \frac{8}{35}, \frac{37}{45}$.
5. $\frac{3}{8}, \frac{2}{3}, \frac{5}{24}, \frac{7}{16}, \frac{11}{18}$.	10. $\frac{23}{27}, \frac{13}{18}, \frac{37}{40}, \frac{11}{12}, \frac{7}{24}$.

Ex. XVII.—REDUCTION OF COMPOUND FRACTIONS.

Reduce to Simple Fractions :

1. $\frac{2}{3}$ of $2\frac{1}{2}$.	7. $\frac{2}{3}$ of $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{2}{3}$ of $\frac{1}{3}$.
2. 16 of $\frac{7}{12}$.	8. $\frac{1}{3}$ of $\frac{1}{12}$ of $\frac{1}{3}$ of $\frac{1}{2}$ of $\frac{1}{3}$.
3. $5\frac{1}{2}$ of $2\frac{2}{3}$.	9. $7\frac{2}{3}$ of $13\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{1}{10}$.
4. $39\frac{1}{6}$ of $\frac{1}{47}$.	10. $9\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{8}$ of $\frac{2}{3}$.
5. $\frac{2}{3}$ of $\frac{2}{3}$ of $\frac{2}{3}$.	11. $6\frac{1}{3}$ of $\frac{2}{3}$ of $\frac{2}{3}$ of $\frac{1}{3}$ of $\frac{1}{13}$.
6. $\frac{1}{3}$ of $\frac{1}{10}$ of $2\frac{2}{3}$.	12. $4\frac{1}{11}$ of $2\frac{2}{11}$ of $1\frac{2}{10}$ of $\frac{1}{16}$ of $3\frac{2}{3}$.

ADDITION.

Ex. XVIII.

1. $\frac{1}{17} + \frac{2}{17} + \frac{3}{17} + \frac{4}{17} + \frac{5}{17} + \frac{6}{17}$.
2. $\frac{5}{8} + \frac{17}{24} + \frac{13}{24} + \frac{5}{12} + \frac{11}{20}$.
3. $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \frac{1}{60}$.
4. $13 + \frac{13}{10} + \frac{13}{100} + \frac{13}{1000} + \frac{13}{10000} + \frac{13}{100000}$.
5. $8\frac{1}{2} + 7\frac{7}{15} + 1\frac{9}{25} + 15 + 4\frac{1}{15} + 2\frac{2}{5}$.
6. $3\frac{7}{20} + 8\frac{4}{37} + 5\frac{10}{11} + 1 + \frac{1}{11} + 7\frac{1}{118}$.
7. $11\frac{10}{23} + 5\frac{1}{2} + 117 + 6\frac{13}{18} + 5\frac{3}{88} + 9\frac{21}{184}$.
8. $7\frac{3}{8} + 11\frac{3}{8} + 2\frac{5}{14} + 16\frac{23}{88} + 9\frac{4}{15} + 1\frac{1}{2}$.
9. $6\frac{7}{11} + 4\frac{1}{2} + 1 + 8\frac{2}{33} + 17\frac{2}{3} + 53\frac{1}{24}$.
10. $9\frac{7}{8} + 11\frac{3}{8} + 2 + 14\frac{3}{8} + 101\frac{3}{4} + 27\frac{5}{12}$.
11. $12\frac{1}{8} + 14\frac{3}{8} + 6\frac{3}{4} + 7 + 1\frac{1}{8} + 8\frac{5}{11}$.
12. $6\frac{13}{8} + 1\frac{5}{8} + 13\frac{10}{21} + \frac{1}{18} + 5\frac{13}{22} + 4\frac{1}{30}$.
13. $9\frac{7}{200} + 1\frac{13}{25} + 4\frac{1}{2} + 5\frac{3}{20} + 17 + 2\frac{1}{125}$.
14. $3\frac{23}{81} + 7\frac{1}{361} + 14\frac{8}{81} + 9 + 6\frac{73}{217} + 15\frac{1}{81}$.
15. $1\frac{13}{80} + 2\frac{80}{1} + 3 + 4\frac{3}{24} + 5\frac{27}{88} + 6\frac{3}{80}$.
16. $275\frac{1}{2} + 1343\frac{1}{3} + 569\frac{1}{4} + 4\frac{1}{2} + \frac{1}{8}$ of 2767.
17. $2\frac{1}{2} + 4\frac{1}{2} + 6\frac{1}{2} + 8\frac{1}{2} + \frac{1}{2}$ of $\frac{2}{3}$ of $1\frac{1}{2}$.
18. $387\frac{1}{2} + 285\frac{1}{4} + 394\frac{1}{2} + 351\frac{1}{80} + \frac{2}{3}$ of 3704.
19. $\frac{7}{15} + 4\frac{3}{8} + \frac{1}{10} + \frac{2}{3}$ of $2\frac{3}{4} + \frac{2}{3}$ of $\frac{5}{28}$ of $\frac{1}{3}$.
20. $2 + \frac{2}{3} + \frac{4}{3} + \frac{5}{4} + \frac{6}{8} + \frac{7}{6} + \frac{8}{7} + \frac{9}{8} + \frac{10}{9} + \frac{11}{10}$.

	£	s.	d.		£	s.	d.
21.	4	16	10 $\frac{1}{2}$	22.	437	19	6 $\frac{3}{8}$
	38	0	11 $\frac{3}{8}$		207	18	11 $\frac{5}{8}$
	5	3	6 $\frac{3}{4}$		596	12	3 $\frac{7}{8}$
	69	19	4 $\frac{1}{2}$		857	13	10 $\frac{9}{10}$
	185	14	5 $\frac{5}{8}$		765	8	9 $\frac{1}{2}$

	tons.	cwt.	qrs.	lbs.		ac.	ro.	po.
23.	14	11	1	23 $\frac{9}{10}$	24.	878	3	15 $\frac{1}{8}$
	23	19	3	25 $\frac{11}{12}$		907	1	37 $\frac{1}{4}$
	1	4	2	14 $\frac{1}{8}$		711	0	2 $\frac{5}{8}$
	15	12	0	27 $\frac{7}{8}$		854	2	29 $\frac{7}{8}$
	79	15	1	18 $\frac{1}{2}$		137	3	15 $\frac{1}{2}$

SUBTRACTION.

Ex. XIX.—CASE I.

1. $11\frac{3}{4} - 6\frac{5}{8}$.	11. $6\frac{3}{8} - 2\frac{5}{22}$.
2. $18\frac{3}{4} - 9\frac{3}{8}$.	12. $9 - \frac{1}{12}$.
3. $14 - 7\frac{5}{17}$.	13. $1\frac{1}{2} - \frac{1}{2}\frac{5}{8}$.
4. $17\frac{3}{8} - 8\frac{1}{2}$.	14. $12\frac{1}{8} - 8\frac{8}{108}$.
5. $49\frac{5}{11} - 13\frac{1}{4}$.	15. $8\frac{1}{8} - 2\frac{3}{8}$.
6. $26\frac{3}{8} - 15\frac{2}{8}$.	16. $23 - 11\frac{1}{2}$.
7. $19 - 12\frac{3}{8}$.	17. $18\frac{5}{8} - 4\frac{39}{118}$.
8. $8\frac{3}{8} - 7\frac{1}{8}$.	18. $24\frac{193}{110} - 13\frac{157}{388}$.
9. $16\frac{3}{14} - 12\frac{3}{8}$.	19. $101\frac{7}{18} - \frac{2}{3}$ of 99.
10. $\frac{3}{4} - \frac{2}{18600}$.	20. $8\frac{1}{16} - \frac{2}{25}$ of 7.
$\text{£} \quad \text{s.} \quad \text{d.}$	$\text{£} \quad \text{s.} \quad \text{d.}$
21. $187 \cdot 11 \cdot 7\frac{1}{2}$	22. $201 \cdot 1 \cdot 6\frac{2}{9}$
$92 \cdot 19 \cdot 7\frac{1}{2}$	$23 \cdot 18 \cdot 11\frac{1}{126}$
$\text{cwt. qrs. lbs. oz.}$	yds. ft. in.
23. $25 \cdot 0 \cdot 17 \cdot 13\frac{1}{2}$	24. $49 \cdot 1 \cdot 7\frac{3}{8}$
$12 \cdot 3 \cdot 25 \cdot 15\frac{1}{2}$	$17 \cdot 2 \cdot 11\frac{1}{243}$

Ex. XX.—CASE II.

- $2\frac{1}{8} + 3\frac{5}{24} - 4\frac{7}{15} - 2\frac{1}{30} + 1\frac{1}{4}$.
- $3\frac{4}{83} - 7\frac{5}{99} + 4\frac{1}{2} - 1\frac{1}{3} + \frac{1}{11}$.
- $\frac{8}{15} + 1\frac{1}{7} - 9\frac{1}{12} + 15\frac{9}{35} - 2\frac{7}{10}$.
- $3\frac{3}{8} - 4\frac{5}{8} + 6\frac{7}{10} - 1\frac{8}{15} + 2\frac{3}{40}$.
- $2\frac{1}{6} + \frac{1}{10} + 1\frac{1}{14} - \frac{1}{18} + 5\frac{1}{12}$.
- $2\frac{1}{2} + 3\frac{2}{7} + 7 - 4\frac{2}{145} + 1\frac{1}{10}$.
- $5\frac{1}{8} - \frac{7}{12} + 10\frac{2}{33} - 3\frac{1}{4} + \frac{7}{25}$.
- $2 - 3\frac{1}{5} + 5\frac{2}{3} - 7\frac{3}{8} + 9\frac{1}{9}$.
- $7\frac{3}{15} - 2\frac{5}{8} + 3\frac{7}{18} - 1\frac{5}{18} - 6\frac{3}{8} + 11\frac{9}{8}$.
- $10\frac{3}{8} - 9\frac{1}{18} + 7 + 8\frac{5}{8} - 1\frac{5}{18} - 6\frac{1}{18}$.
- $8\frac{5}{15} - 3\frac{1}{5} + 2\frac{9}{35} - 1\frac{2}{3} - 3\frac{9}{14} + 5\frac{5}{8}$.
- $1\frac{1}{3} + 3\frac{2}{3} - 7\frac{1}{2} - 5\frac{7}{9} + 12\frac{2}{3} + 2\frac{5}{8}$.
- $24\frac{7}{8} - \frac{1}{3} + 36\frac{1}{2} - \frac{5}{12} + \frac{1}{3} - 55\frac{3}{8}$.
- $16\frac{5}{8} - 11\frac{1}{80} + 13\frac{1}{12} + 2\frac{7}{8} - 15 - 1\frac{4}{35}$.
- $5\frac{1}{8} - 11\frac{1}{14} + 12\frac{1}{11} - 4\frac{5}{8} - \frac{1}{3} + 14\frac{1}{2}$.
- $11\frac{1}{6} - 9\frac{29}{108} + 7\frac{17}{189} - 5\frac{4}{238} - 3\frac{1}{183} + 1$.

MULTIPLICATION.

Ex. XXI.

1. Multiply 21685 by $27\frac{3}{4}$, $6\frac{5}{8}$, and $19\frac{5}{8}$.
2. Multiply 2347 by $16\frac{1}{2}$, $5\frac{2}{3}$, and $73\frac{4}{11}$.
3. $\frac{18}{105} \times \frac{84}{360} \times \frac{295}{150}$.
4. $\frac{140}{368} \times 1\frac{1}{5} \times \frac{15}{64} \times 1\frac{1}{10}$.
5. $\frac{504}{750} \times \frac{88}{860} \times 5\frac{4}{8} \times 2\frac{14}{13}$.
6. $123\frac{3}{4} \times 26\frac{5}{8} \times 79\frac{11}{15} \times \frac{35}{80}$.
7. $\frac{11}{3} \times 5\frac{1}{5} \times \frac{7}{4} \times 3\frac{1}{9} \times \frac{7}{6} \times \frac{7}{4}$.
8. $\frac{133}{400} \times \frac{48}{31} \times \frac{143}{111} \times \frac{201}{330} \times \frac{207}{33}$.
9. $\frac{623}{1128} \times 26\frac{89}{129} \times \frac{104}{970} \times 2\frac{63}{119} \times 7\frac{68}{91} \times \frac{21}{1565}$.
10. $\frac{2}{3} \times 5\frac{1}{2} \times 6 \times 11\frac{5}{9} \times \frac{3}{28} \times 14\frac{4}{7}$.
11. $\frac{43}{63} \times 12\frac{7}{5} \times \frac{133}{150} \times \frac{113}{368} \times 8\frac{15}{16} \times 13\frac{9}{7}$.
12. $\frac{21}{160} \times 9\frac{9}{11} \times 2\frac{19}{27} \times \frac{9}{16} \times 4\frac{1}{4} \times \frac{11}{2} \times \frac{6}{17} \times 2\frac{4}{15}$.

DIVISION.

Ex. XXII.

- | | |
|---|--|
| 1. $\frac{155}{994} \div \frac{5}{7}$. | 6. $16\frac{8}{9} \div \frac{2}{3}$ of $7\frac{5}{6}$. |
| 2. $\frac{7}{16} \div \frac{3}{20}$. | 7. $\frac{3}{4}$ of $1\frac{2}{3}$ of $12\frac{1}{2} \div 6\frac{2}{3}$. |
| 3. $6\frac{15}{8} \div 4\frac{5}{8}$. | 8. $4\frac{2}{3}$ of $2\frac{1}{4} \div 7\frac{1}{2}$ of $19\frac{1}{8}$. |
| 4. $9\frac{1}{5} \div \frac{2}{3}$ of 7. | 9. $\frac{4}{5}$ of $\frac{16}{12}$ of $\frac{27}{26} \div \frac{3}{4}$ of $\frac{6}{15}$ of $\frac{2}{3}$. |
| 5. $2911\frac{4}{5} \div 92\frac{2}{5}$. | 10. $\frac{2}{3}$ of $1\frac{1}{5}$ of $\frac{6}{5} \div 3\frac{1}{2}$ of $2\frac{2}{5}$ of $\frac{4}{3}$. |

SIMPLIFICATION OF MIXED FRACTIONAL EXPRESSIONS.

Ex. XXIII.

Reduce to their simplest forms :

1. $\frac{5}{9}$; $\frac{8\frac{3}{4}}{38}$; $\frac{206\frac{1}{4}}{240}$; $\frac{35}{71\frac{1}{3}}$; $\frac{3\frac{3}{4}}{5\frac{1}{7}}$ of $4\frac{3}{5}$.
2. $\frac{21\frac{7}{8}}{\frac{9}{14} + \frac{5}{8}}$; $\frac{7\frac{1}{3} + 4\frac{1}{2}}{3\frac{1}{3} \cdot 4\frac{1}{2}}$; $\frac{2\frac{1}{2} + \frac{1}{6}}{3\frac{1}{2} - \frac{1}{8}}$; $\frac{4\frac{1}{7} - 2\frac{1}{4}}{6\frac{1}{2} - 2\frac{1}{7}}$
3. $\frac{3\frac{1}{2} + 2\frac{1}{4} + 4\frac{1}{3}}{4\frac{1}{3} + 9\frac{1}{4} - 1\frac{1}{2}}$; $\frac{2\frac{1}{2} + 3\frac{1}{4} \times 4\frac{1}{3}}{5\frac{1}{2} \times 1\frac{3}{11} - 3\frac{3}{4}}$

4. $\frac{\frac{5}{9} \text{ of } \frac{2}{3} \text{ of } 13\frac{1}{2}}{\frac{1}{9} \text{ of } \frac{2}{3} + 34}$; $\frac{4\frac{1}{3} \times 4\frac{1}{3} \times 4\frac{1}{3} - 1}{4\frac{1}{3} \times 4\frac{1}{3} - 1}$
5. $\frac{1 - \frac{3}{10} \text{ of } 1\frac{3}{4} \text{ of } \frac{101}{114}}{2 - \frac{2}{3} \text{ of } 1\frac{3}{4} \text{ of } \frac{101}{114}}$; $\frac{\frac{2}{3} \text{ of } \frac{3}{4} - \frac{1}{5} \times \frac{1}{9}}{3\frac{1}{3} - 2\frac{2}{3}}$
6. $\frac{\frac{1}{2} \cdot \frac{1}{2} - 1}{2} \cdot \frac{\frac{1}{2} - 2}{3}$; $\frac{\frac{1}{2} + \frac{1}{3} + \frac{1}{4}}{\frac{1}{2\frac{1}{2}} + \frac{1}{3\frac{1}{2}} + \frac{1}{4\frac{1}{2}}}$
7. $\frac{1}{2 + \frac{1}{2 + \frac{1}{2}}}$; $\frac{1}{3 + \frac{1}{7 + \frac{1}{10}}}$; $\frac{2}{3 + \frac{4}{5 + \frac{2}{7}}}$
8. $\frac{6}{7 + \frac{1}{8 + \frac{1}{9}}}$; $\frac{1}{2 + \frac{1}{3 + \frac{1}{4 + \frac{1}{5}}}}$; $2\frac{1}{2} + \frac{1}{3\frac{1}{3} + \frac{1}{4\frac{1}{4}}}$
9. $\frac{1}{2} \cdot \frac{\frac{1}{2} - 1}{2} \cdot \frac{\frac{1}{2} - 2}{3} \cdot \frac{\frac{1}{2} - 3}{4} \cdot \frac{\frac{1}{2} - 4}{5}$
10. $\frac{3\frac{2}{3} \text{ of } 6\frac{1}{3}}{1\frac{1}{3}} - \frac{4\frac{7}{8} \text{ of } 3\frac{3}{13}}{2\frac{1}{3}}$
11. $\frac{3 \times 4\frac{8}{9}}{7\frac{1}{2} \text{ of } 4\frac{2}{3}} + \frac{3\frac{2}{3} \text{ of } 8\frac{5}{9}}{3\frac{2}{3} - 2\frac{1}{3}}$
12. $\frac{2}{3} \text{ of } 4 + 9 + \frac{2\frac{1}{2}}{7} + \frac{1\frac{2}{3}}{2\frac{1}{2}}$
13. $5\frac{\frac{1}{2} - \frac{1}{3}}{\frac{1}{2} + \frac{1}{3}} \text{ of } \frac{3\frac{1}{4}}{4\frac{1}{3}} \div \frac{2\frac{3}{8}}{6\frac{1}{2}}$
14. $\frac{2}{3} \text{ of } \frac{4\frac{1}{6}}{5\frac{1}{4}} - \frac{2}{3} \text{ of } \frac{7\frac{1}{6}}{5\frac{1}{4}}$; $\frac{3\frac{1}{2} - 2\frac{1}{3}}{4\frac{1}{12}} \times \frac{4\frac{1}{6}}{5\frac{1}{4} - 2\frac{1}{2}}$
15. $\frac{\frac{7}{8} \text{ of } \frac{2}{3}}{15\frac{1}{4}} \times \frac{21}{16\frac{2}{3}} \times \frac{39\frac{2}{3}}{7} \times \frac{1\frac{1}{3}}{\frac{1}{3} \text{ of } 16\frac{1}{2}}$
16. $\frac{2 + 3}{4 + 5} \div \frac{4 + 3\frac{1}{2}}{5 + 5\frac{1}{2}}$; $\frac{4\frac{8}{11}}{7\frac{3}{10}} \div \frac{1\frac{7}{22}}{17\frac{2}{3}}$; $\frac{48\frac{4}{5}}{1085\frac{7}{10}} \div \frac{7\frac{3}{11}}{174\frac{3}{17}}$
17. $(\frac{1}{2} + \frac{1}{3}) \times (\frac{1}{4} + \frac{1}{5}) - (\frac{1}{2} - \frac{1}{3}) \times (\frac{1}{4} - \frac{1}{5})$
18. $(\frac{1}{2} + \frac{1}{3}) \times (\frac{1}{4} - \frac{1}{5}) \div \frac{1}{8} - \frac{1}{7}$;
 $(\frac{1}{2} + \frac{1}{3}) \times (\frac{1}{4} - \frac{1}{5}) \div (\frac{1}{8} - \frac{1}{7})$
19. $(11\frac{1}{2} - 10\frac{2}{3}) \times (1\frac{1}{11} + 1\frac{6}{11})$
20. $(3\frac{5}{6} + 4\frac{1}{3}) \div (7\frac{1}{18} - 2\frac{1}{3})$
21. $(7\frac{5}{6} + 2 - 5\frac{1}{6}) \times (4\frac{1}{6} - 3\frac{2}{3})$
22. $(6\frac{1}{3} - 3\frac{5}{3} + 2\frac{2}{3}) \div (7\frac{1}{3} - 3\frac{2}{3} + 8\frac{2}{3})$

23. $\{3\frac{1}{4} \times \frac{2}{15} + \frac{1}{15} \div 5\frac{1}{2} - \frac{7}{25};$
 $\{3\frac{1}{4} \times (\frac{2}{15} + \frac{1}{15} \div 5\frac{1}{2}) - \frac{7}{25}.$
24. $(11\frac{3}{8} + 4\frac{1}{2} + 5\frac{5}{8}) \times (7\frac{3}{4} - 5\frac{3}{8}) \div (14\frac{1}{8} + 8\frac{1}{2}).$
25. $\frac{1}{12}(1 - \frac{5}{12}) + \frac{5}{12} \times \frac{1}{12} \times (\frac{1}{2} + \frac{5}{12}).$
26. $\frac{1}{15} + \frac{4}{5} \text{ of } \frac{1}{2} \times 1\frac{3}{4} \times (\frac{1}{12} - \frac{1}{8}).$
27. $8\frac{5}{8} + \frac{4}{5} + 3\frac{5}{8} \text{ of } 8\frac{9}{10} - 14\frac{3}{8} \div 4\frac{1}{2}.$
28. $1\frac{1}{2} + \frac{5}{8} \text{ of } \frac{1}{2} + \frac{4}{5\frac{1}{10}}$
29. $(\frac{2}{15} + \frac{1}{3}) \div (3 - \frac{1}{3}) \times (\frac{1}{3} + 2\frac{1}{2}).$
30. $\frac{\frac{2}{25} - \frac{1}{15} + \frac{1}{21} + \frac{1}{140} - \frac{8}{63}}{(\frac{1}{2} + \frac{1}{12}) \times (\frac{1}{4} - \frac{2}{3})}$
31. $(2\frac{1}{2} + 1\frac{1}{2} + 3\frac{1}{2}) \div \frac{1}{2} \text{ of } \frac{2}{3} \text{ of } 1\frac{5}{8}.$
32. $(1\frac{1}{2} + 2\frac{3}{8} + 3\frac{5}{8}) \div \frac{4}{5} \text{ of } \frac{2}{3} \text{ of } 2\frac{1}{2}.$
33. $\frac{2247}{1017} \div \frac{903}{1107} \times \frac{713}{116} \div \frac{1926}{116}.$
34. $(4 - 2\frac{1}{4}) \times (6\frac{1}{2} - 2\frac{1}{4}) + (2\frac{1}{2} + \frac{1}{8}) \div (3\frac{1}{2} - \frac{1}{8}).$
35. $\begin{cases} 2\frac{1}{2} + 3\frac{5}{12} \text{ of } 6\frac{1}{2} - 3\frac{3}{4}; \\ (2\frac{1}{2} + 3\frac{5}{12}) \text{ of } 6\frac{1}{2} - 3\frac{3}{4}; \\ 2\frac{1}{2} + 3\frac{5}{12} \text{ of } (6\frac{1}{2} - 3\frac{3}{4}); \\ (2\frac{1}{2} + 3\frac{5}{12}) \text{ of } (6\frac{1}{2} - 3\frac{3}{4}). \end{cases}$
36. $\{8\frac{2}{3} \text{ of } 1\frac{1}{12} + 2\frac{1}{4} \text{ of } 2\frac{1}{2} - 2\frac{1}{4} \div \frac{7}{12};$
 $\{8\frac{2}{3} \text{ of } (1\frac{1}{12} + 2\frac{1}{4}) \text{ of } 2\frac{1}{2} - 2\frac{1}{4} \div \frac{7}{12}.$
37. $\frac{1}{2} + 3\frac{3}{4} \text{ of } 1\frac{1}{12} + (\frac{3}{4} \div \frac{1}{3}) \text{ of } (2\frac{1}{2} - \frac{1}{2}) - \frac{1}{12}.$
38. $(4\frac{1}{3} - 2\frac{1}{4}) \times (7\frac{1}{3} + 2\frac{1}{12}) - (8\frac{1}{2} - 3\frac{1}{6}) + (2\frac{1}{6} - \frac{1}{18}) \div (\frac{1}{4} + \frac{1}{6}).$
39. $\begin{cases} 2\frac{1}{4} + 3\frac{1}{3} \text{ of } 2\frac{5}{8} - 1\frac{7}{24} - \frac{1}{12}; \\ 2\frac{1}{4} + 3\frac{1}{3} \text{ of } (2\frac{5}{8} - 1\frac{7}{24} - \frac{1}{12}); \\ (2\frac{1}{4} + 3\frac{1}{3}) \text{ of } 2\frac{5}{8} - 1\frac{7}{24} - \frac{1}{12}; \\ (2\frac{1}{4} + 3\frac{1}{3}) \text{ of } (2\frac{5}{8} - 1\frac{7}{24} - \frac{1}{12}). \end{cases}$
40. $(\frac{1}{3} + \frac{2}{3} \text{ of } \frac{1}{12} - \frac{1}{12}) \div (\frac{1}{2} - 1\frac{1}{4} + \frac{1}{12}) - \frac{1}{12}.$
41. $(1 + \frac{2}{3} + \frac{5}{8} + \frac{1}{12} - \frac{2}{3} \text{ of } \frac{5}{8} \text{ of } \frac{1}{12}) \times 5\frac{1}{2}.$
42. $(10\frac{1}{2} + 2\frac{3}{4} + \frac{1}{2}) \times 3\frac{1}{5} - 2\frac{9}{20} \div (\frac{2}{14} \text{ of } 21\frac{1}{2}).$
43. $\begin{cases} 2\frac{1}{4} + 3\frac{1}{3} \text{ of } 5\frac{1}{14} - 4\frac{5}{21}; \\ 2\frac{1}{4} + 3\frac{1}{3} \text{ of } (5\frac{1}{14} - 4\frac{5}{21}); \\ (2\frac{1}{4} + 3\frac{1}{3}) \text{ of } 5\frac{1}{14} - 4\frac{5}{21}; \\ (2\frac{1}{4} + 3\frac{1}{3}) \text{ of } (5\frac{1}{14} - 4\frac{5}{21}). \end{cases}$
44. $\frac{1}{12}(\frac{2}{3} - \frac{1}{2}) + \frac{5}{27} \text{ of } 1\frac{1}{2} \text{ of } (3\frac{3}{4} - 1\frac{5}{4}) - (2\frac{5}{8} - 1\frac{1}{4}) \div 2\frac{5}{8}.$
45. $\begin{cases} (3\frac{1}{2} + 2\frac{1}{4}) \times (3\frac{1}{8} - 1\frac{1}{2} - 1\frac{1}{4}); \\ (3\frac{1}{2} + 2\frac{1}{4}) \times 3\frac{1}{8} - (1\frac{1}{2} - 1\frac{1}{4}); \\ (3\frac{1}{2} + 2\frac{1}{4}) \times (3\frac{1}{8} - 1\frac{1}{2}) - 1\frac{1}{4}; \\ 3\frac{1}{2} + 2\frac{1}{4} \times 3\frac{1}{8} - 1\frac{1}{2} - 1\frac{1}{4}. \end{cases}$

46. $\frac{\frac{3}{4} \times \frac{3}{4} + \frac{1}{2} \div 2\frac{1}{2}}{(\frac{3}{4} - \frac{1}{2}) \div (\frac{1}{2} + \frac{2}{3} \text{ of } 6)}$
47. $(\frac{1}{2} + \frac{2\frac{1}{2}}{5} \times \frac{53\frac{1}{2}}{10}) \div \frac{1}{6}$
48. $(\frac{9}{10\frac{1}{2}} + \frac{11\frac{1}{2}}{12} \times \frac{13\frac{1}{2}}{1\frac{1}{2}}) \div \frac{5}{3}$
49. $\frac{4\frac{7}{10} + 5\frac{9}{11} - 2\frac{1}{2}}{4\frac{7}{10} \text{ of } 5\frac{9}{11} \text{ of } 2\frac{1}{2}} - \frac{7}{8} \times \frac{9}{10} \times \frac{7}{47}$
50. $2\frac{3}{4} - 5\frac{1}{6} \text{ of } (\frac{1}{2} + \frac{1}{3} - \frac{2\frac{1}{2}}{3\frac{1}{4}}) + 4$
51. $\frac{17\frac{1}{2}(5\frac{5}{8} + 3\frac{3}{4} - 1\frac{9}{10})}{5\frac{5}{8} \times 3\frac{3}{4} \times 1\frac{9}{10}} + \frac{3}{8} \div \frac{3}{4} \text{ of } \frac{5}{6} \text{ of } \frac{3\frac{1}{2}}{7\frac{1}{2}}$
52. $\frac{(\frac{2}{3} - \frac{4}{15}) \text{ of } (\frac{1}{4} + \frac{4}{13})}{\frac{2}{3} - \frac{4}{15} \text{ of } \frac{1}{4} + \frac{4}{13}}$
53. $\frac{6\frac{1}{2} - 3\frac{3}{8}}{6\frac{1}{2} + 3\frac{3}{8}} + \frac{1\frac{7}{8}}{11\frac{1}{4}} \text{ of } 2 + \frac{1}{3} \text{ of } \frac{1}{6\frac{1}{2}}$
54. $\frac{7\frac{1}{2}}{6\frac{3}{8}} + \frac{11\frac{1}{2} - 2\frac{3}{8}}{11\frac{1}{2} + 2\frac{3}{8}} \times 10\frac{9}{13} - 7\frac{1}{8}$
55. $\begin{cases} 1\frac{1}{2} + \frac{3\frac{1}{2} - \frac{1}{4}}{3\frac{1}{2} + \frac{1}{4}} - 2\frac{3}{8} \text{ of } \frac{1}{13} - \frac{9}{7}; \\ 1\frac{1}{2} + \frac{3\frac{1}{2} - \frac{1}{4}}{3\frac{1}{2} + \frac{1}{4}} - 2\frac{3}{8} \text{ of } (\frac{1}{13} - \frac{9}{7}); \\ 1\frac{1}{2} + (\frac{3\frac{1}{2} - \frac{1}{4}}{3\frac{1}{2} + \frac{1}{4}} - 2\frac{3}{8}) \text{ of } \frac{1}{13} - \frac{9}{7}. \end{cases}$
56. $7\frac{1\frac{3}{8}}{2\frac{5}{8}} + \frac{8\frac{1}{8} + \frac{1}{2}}{11\frac{1}{8} + 5\frac{1}{8}} - \frac{7}{45} \text{ of } 6\frac{1}{2} \text{ of } (1\frac{1}{3} + 3\frac{1}{15})$
57. $\begin{cases} 2\frac{1}{2} + \frac{3\frac{1}{4}}{4} - 2\frac{1}{2} \text{ of } \frac{4}{5} + \frac{\frac{1}{2} - \frac{1}{3}}{\frac{1}{2} + \frac{1}{3}} \text{ of } \frac{1}{2}; \\ 2\frac{1}{2} + (\frac{3\frac{1}{4}}{4} - 2\frac{1}{2}) \text{ of } \frac{4}{5} + \frac{\frac{1}{2} - \frac{1}{3}}{\frac{1}{2} + \frac{1}{3}} \text{ of } \frac{1}{2}; \\ (2\frac{1}{2} + \frac{3\frac{1}{4}}{4} - 2\frac{1}{2}) \text{ of } \frac{4}{5} + \frac{\frac{1}{2} - \frac{1}{3}}{\frac{1}{2} + \frac{1}{3}} \text{ of } \frac{1}{2}; \\ 2\frac{1}{2} + \frac{3\frac{1}{4}}{4} - 2\frac{1}{2} \text{ of } (\frac{4}{5} + \frac{\frac{1}{2} - \frac{1}{3}}{\frac{1}{2} + \frac{1}{3}} \text{ of } \frac{1}{2}); \\ 2\frac{1}{2} + (\frac{3\frac{1}{4}}{4} - 2\frac{1}{2}) \text{ of } (\frac{4}{5} + \frac{\frac{1}{2} - \frac{1}{3}}{\frac{1}{2} + \frac{1}{3}} \text{ of } \frac{1}{2}). \end{cases}$

$$58. \frac{1\frac{1}{2} + 1\frac{2}{3}}{3\frac{1}{2}} - \frac{17\frac{1}{2}}{16\frac{1}{3}} + \frac{2\frac{1}{4} + 6\frac{2}{14}}{7\frac{1}{2} - 4\frac{2}{3}} \text{ of } 2 \div \frac{7\frac{1}{2}}{6\frac{1}{3}}$$

$$59. 1\frac{1}{2} + \frac{3\frac{1}{2} - \frac{1}{4}}{3\frac{1}{2} + \frac{1}{4}} - 2\frac{2}{3} \text{ of } \frac{1}{18} - \frac{2}{9}.$$

$$60. \begin{cases} 2\frac{1}{2} + 3\frac{2}{3} \text{ of } \frac{4}{1\frac{1}{3} - \frac{1}{4}} - \frac{3\frac{1}{2}}{4\frac{1}{3}} \\ (2\frac{1}{2} + 3\frac{2}{3}) \text{ of } \frac{4}{1\frac{1}{3} - \frac{1}{4}} - \frac{3\frac{1}{2}}{4\frac{1}{3}} \\ 2\frac{1}{2} + 3\frac{2}{3} \text{ of } \left(\frac{4}{1\frac{1}{3} - \frac{1}{4}} - \frac{3\frac{1}{2}}{4\frac{1}{3}} \right) \end{cases}$$

$$61. \begin{cases} \frac{1\frac{1}{2}}{2\frac{1}{3}} + 2\frac{1}{3} \text{ of } 1\frac{1}{3} - 4\frac{3}{4} + 2\frac{1}{3}; \\ \frac{1\frac{1}{2}}{2\frac{1}{3}} + 2\frac{1}{3} \text{ of } (1\frac{1}{3} - 4\frac{3}{4}) + 2\frac{1}{3}; \\ \left(\frac{1\frac{1}{2}}{2\frac{1}{3}} + 2\frac{1}{3} \right) \text{ of } (1\frac{1}{3} - 4\frac{3}{4}) + 2\frac{1}{3}; \\ \left(\frac{1\frac{1}{2}}{2\frac{1}{3}} + 2\frac{1}{3} \right) \text{ of } 1\frac{1}{3} - (4\frac{3}{4} + 2\frac{1}{3}). \end{cases}$$

$$62. 7\frac{7}{10} \text{ of } (6\frac{2}{3} - 4\frac{10}{11}) \div (1\frac{7}{10} - 4\frac{5}{22} \text{ of } \frac{1}{31}) + \frac{1\frac{2}{3}}{1\frac{1}{5}} \text{ of } \frac{1}{2\frac{1}{2}}$$

$$63. \frac{\frac{3}{4} \times \frac{2}{3} + \frac{2}{3} (\frac{1}{4} \div \frac{5}{7}) - \frac{1}{8} \text{ of } \frac{2}{3} \text{ of } 4\frac{1}{2} + \frac{2}{3} \text{ of } \frac{21\frac{1}{3}}{16}}{\frac{1}{16} - \frac{1}{18} + \frac{1}{15} - \frac{1}{12} + \frac{1}{12}}$$

VALUATION OF CONCRETE FRACTIONS.

Ex. XXIV.

Find the value of:

1. $23\frac{5}{8}$ of £140 3s. $6\frac{1}{2}d$.
2. $33\frac{2}{3}$ of £128 9s. $10\frac{1}{2}d$.
3. $\frac{3}{8}$ of $2\frac{1}{2}$ of $3\frac{1}{3}$ of $\frac{1}{20}$ of 3 cwt. 3 qrs.
4. $\frac{8}{15}$ of $1\frac{2}{3}$ of £140 17s. $6\frac{3}{4}d$.
5. $\frac{10}{11}$ of $12\frac{2}{3}$ of £272 18s. $9\frac{1}{4}d$.
6. $2\frac{1}{3}$ of $\frac{8}{7}$ of £2347 19s. $7\frac{1}{4}d$.
7. $\frac{8}{27}$ of 2 tons 6 cwt. 0 qrs. 18 lbs.
8. $8\frac{1}{4}$ of $\frac{1}{4}\frac{1}{5}$ of 14 lbs. 8 oz. 18 dwts. 17 grs.

9. $\frac{2\frac{1}{2} \div 1\frac{3}{4}}{2\frac{1}{2} - 1\frac{3}{4}}$ of 13s. 4d.
10. $\frac{3\frac{1}{2} - 2\frac{1}{3} + \frac{3}{4} - \frac{1}{4} \text{ of } \frac{2}{17}}{4\frac{2}{3} \text{ of } \frac{3}{4}}$ of £2 12s.
11. £2040 18s. 5d. \div 4 $\frac{1}{4}$.
12. £678 9s. 11 $\frac{3}{4}$ d. \div 214 $\frac{1}{3}$.
13. £89491 10s. 7 $\frac{1}{2}$ d. \div 416 $\frac{1}{2}$.
14. £99 17s. 0 $\frac{1}{2}$ d. \div 19 $\frac{3}{4}$.
15. 3 $\frac{5}{8}$ of £1 + 9 $\frac{3}{4}$ of 1s. + 2 $\frac{1}{3}$ of 1d.
16. $\frac{1}{8}$ of £100 + £1000 $\frac{3}{8}$ + $\frac{3}{8}$ of $\frac{3}{4}$ of £7 $\frac{1}{2}$ + $\frac{2}{3}$ of $\frac{5}{8}$ s.
17. $\frac{3}{8}$ of 2 $\frac{1}{2}$ of 4 $\frac{1}{8}$ of 3 miles 4 furs. 5 po. — $\frac{1}{4}$ of 3 $\frac{1}{2}$ of 2 $\frac{1}{3}$ of 1 mile 2 furs. 19 po.
18. $\frac{3}{8}$ of 4s. 7d. — $\frac{1}{4}\frac{3}{8}$ of 5s. + $\frac{7}{20}$ of 1s. 5 $\frac{1}{2}$ d.
19. $\frac{1}{6}$ of $\frac{3}{10}$ of £1 — $\frac{7}{6}$ of 4 $\frac{1}{2}$ d. + $\frac{3}{11}$ of 2s. 6d.
20. $\frac{3}{8}$ of an acre + $\frac{5}{8}$ of a rood — $\frac{1}{11}$ of a perch.
21. $\frac{3}{4}$ of £1 5s. — $\frac{1\frac{3}{8}}{6\frac{1}{2}}$ of a guinea + $\frac{2}{3}$ of 3s. 6d.
22. $\frac{3}{8}$ of 1 $\frac{3}{8}$ of $\frac{3}{1\frac{3}{8}}$ of an acre — 2 $\frac{1}{2}$ of 3 yds. + $\frac{3}{8}$ of 2 roods.
23. $\frac{\frac{1}{2} \text{ of } \frac{2}{3} - \frac{2}{3}}{\frac{1}{2} \text{ of } \frac{2}{3} \text{ of } \frac{2}{3}}$ of 2 acres — 2 $\frac{3}{4}$ of a rood + $\frac{5}{11}$ of 6 yds.
24. Compare the values of $\frac{1}{10}$ of £1, $\frac{1}{20}$ of a guinea, and $\frac{1}{85}$ of a crown.

TO EXPRESS ONE QUANTITY IN TERMS OF ANOTHER.

Ex. XXV.

- Express £1 2s. 4 $\frac{1}{2}$ d. as a fraction of £1 17s. 3 $\frac{1}{2}$ d.
- Express £227 12s. 1d. as a fraction of £273 2s. 6d.
- Express 7 ft. 5 $\frac{1}{2}$ in. as a fraction of a furlong.
- What fractions of £1 are $\frac{5}{8}$ of a penny and $\frac{3}{8}$ of a farthing?
- Reduce $\frac{2}{3}$ of 3s. 4d. to the fraction of 2s. 6d.
- Express $\frac{3}{4}$ of $\frac{1}{3}$ of 1 cwt. 2 qrs. 3 lbs. as a fraction of 5 tons.
- Express $\frac{2}{3}$ of $\frac{5}{6}$ of £1 8s. 7d. as a fraction of £1 4s. 10d.
- Express $\frac{2}{3}$ of 4 cwt. 2 qrs. as a fraction of $\frac{9}{10}$ of 3 cwt. 1 qr. 14 lbs.
- What fraction of $\frac{4}{5}$ of 3 $\frac{1}{2}$ of 16s. 8d. is $\frac{3}{4}$ of $\frac{5}{8}$ of 17s. 6d.?

10. Express $\frac{4}{17}$ of $3\frac{5}{9}$ of $\frac{7}{16}$ of 18s. in terms of $\frac{1}{2}$ of $7\frac{1}{2}$ of £2 14s. 7d.
11. What part of $\frac{3}{4}$ of $\frac{7}{8}$ of 2 cwt. 3 qrs. 7 lbs. is $2\frac{1}{15}$ of 1 qr. 14 lbs.?
12. What part of $\frac{1}{10}$ of $2\frac{1}{2}$ of 13s. 9d. is $\frac{5}{8}$ of $\frac{7}{8}$ of 13s. 4d.?
13. Reduce $\frac{3\frac{1}{2}}{4\frac{1}{2}}$ of 16 lbs. 14 oz. to the fraction of $\frac{4\frac{1}{2}}{3\frac{1}{4}}$ of $\frac{1}{4}$ cwt.
14. Reduce $2\frac{1}{3}$ of 6 cwt. to the fraction of $\frac{1}{2}$ of $2\frac{1}{4}$ of $\frac{\frac{1}{2}-\frac{1}{4}}{\frac{1}{8}+\frac{1}{4}}$ of $5\frac{1}{2}$ tons.
15. Express $1\frac{1}{2}$ of $\frac{1}{\frac{1}{2}+\frac{1}{3}}$ of 2 tons in terms of $7\frac{1}{2}$ of $\frac{\frac{1}{2}-\frac{1}{3}}{\frac{1}{2}+3}$ of $\frac{2}{3}$ of $20\frac{1}{2}$ tons.
16. What fraction of $3\frac{1}{2}$ lbs. Avoirdupois is $2\frac{5}{8}$ of $2\frac{1}{2}$ lbs. Troy?
17. Reduce $\frac{8}{9}$ of £1 4s. — $\frac{2}{3}$ of 17s. 6d. + $3\frac{1}{4}$ of $8\frac{1}{2}$ of 10d. to the fraction of £1 14s. 6d.
18. Express $\frac{3\frac{1}{2}}{1\frac{1}{2}}$ of $\{\frac{1}{120}$ of £1 — $\frac{5}{7}$ of 1s.} as a fraction of a moidore.
19. Express $(\frac{1}{2} + \frac{1}{3})$ of $\frac{1}{7}$ of 21s. as a fraction of $2\frac{1}{2}$ of $\frac{1\frac{1}{2}}{3\frac{1}{4}}$ of 27s.

MISCELLANEOUS EXAMPLES IN FRACTIONS.

Ex. XXVI.

1. What fraction added to the sum of $\frac{4}{5}$, $\frac{3}{8}$, and $2\frac{1}{2}$ will make the result equal to 5?
2. Find what fraction multiplied by the sum of $2\frac{3}{5}$, $1\frac{1}{10}$, and $\frac{4}{15}$ will make the product 17.
3. What fraction divided by $1\frac{2}{3}$ will produce $22\frac{4}{11}$?
4. Required the greatest and the least of the fractions $\frac{2}{3}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{4}{5}$, and $\frac{7}{12}$.
5. Find what fraction added to the sum of $\frac{3}{4}$, $1\frac{1}{5}$, and $2\frac{5}{8}$, will make the result a whole number.
6. Reduce $\frac{\frac{3}{4}$ of a crown + $\frac{2}{3}$ of a shilling}{4s. 11d.} to its simplest form.
7. There is a fraction which, multiplied by $\frac{2}{3}$ of $\frac{4}{5}$ of $1\frac{1}{2}$, will produce 1; find its square.
8. Of what sum is 4 shillings and 3 pence and $1\frac{1}{4}$ farthing, three-sevenths?
9. If the excess of $\frac{2}{13}$ above the remainder be £60, what is the whole sum?

10. Multiply the sum of $\frac{2}{3}$ and $\frac{5}{6}$ by their difference, and divide the product by $8\frac{2}{3}$.

11. Multiply the sum of $\frac{1}{2}$, $1\frac{1}{2}$ and $\frac{5}{6}$ by the difference of $\frac{4}{15}$ and $\frac{2}{30}$, and divide the product by $\frac{11}{15}$ of $1\frac{1}{4}$.

12. Find the sum of the greatest and least of the fractions $\frac{2}{3}$, $\frac{5}{12}$, $\frac{4}{5}$, and $\frac{7}{10}$; the sum of the other two; and the difference of those sums.

13. What fraction is that from which if there be taken $\frac{2}{3}$ of $\frac{7}{18}$ of $3\frac{2}{3}$, and to the remainder there be added $\frac{2}{3}$ of $\frac{9\frac{2}{3}}{2}$, the sum will be 13?

14. Reduce $\frac{\frac{2}{15} \text{ of a guinea} - \frac{2}{15} \text{ of a } £}{8s. 10\frac{3}{4}d.}$ to its simplest form.

15. Take $\frac{5}{6}$ from the sum of $5\frac{1}{2}$ and $3\frac{2}{3}$, and divide the remainder by the difference of 11 and $2\frac{2}{3}$.

16. Out of a purse containing £11 7s. 3d., $\frac{2}{3}$ of its contents were taken; find the value of $\frac{2}{3}$ of $\frac{7}{15}$ of $\frac{21\frac{1}{2}}{15}$ of the remainder.

17. A post has $\frac{1}{2}$ of its length in the mud, $\frac{1}{4}$ in the water, and 12 ft. 6 in. above the water; what is the length of the post?

18. Certain articles are sold singly at £13 17s. $2\frac{1}{4}d.$ each; but if more than a dozen are purchased by one person the charge to him is diminished by £1 19s. $11\frac{1}{2}d.$ each; what is the cost of $39\frac{1}{2}$ of these articles on these terms?

19. If a person's salary be £100 a year, payable quarterly, find the difference between his daily earnings in the two quarters, beginning respectively on the 24th of June and the 29th of September.

20. 5760 lbs. Avoirdupois being equivalent to 7000 lbs. Troy, find the number of drams Avoirdupois in a pound Troy.

21. Reduce 2375 $\frac{1}{2}$ Spanish dollars to English money, the exchange being at 3s. 4d. per dollar. And find the value of 100,000 rupees, at 2s. $3\frac{1}{2}d.$ each.

22. Reduce $\frac{\frac{2\frac{5}{8}}{2\frac{1}{4} - \frac{7}{12}} \text{ of } \frac{2}{15} \text{ of } £5 - \frac{2}{3} \text{ of a guinea}}{£43 \text{ } 8s. \text{ } 2\frac{8}{15}d.}$ to a simple fraction.

23. Reduce $1\frac{1}{2}$ of $1\frac{1}{2}$ of 115 dollars each 4s. $3\frac{3}{4}d.$ to the fraction of $1\frac{1}{4}$ of $2\frac{1}{2}$ of 207 crown pieces; and express this part of 16 coins each 73s. 9d. in guineas and the fraction of a guinea.

24. Out of £4 7s. 6d., one-third is paid to A, and one-seventh to B; after this, four-elevenths of the remainder are paid to A, and the rest to B; find the sums respectively received by A and B.

25. The mint formerly made $44\frac{1}{2}$ guineas out of 1 lb. Troy of gold alloy; if $46\frac{3}{4}$ sovereigns are now made out of the same quantity of gold alloy, is there a gain or a loss by the change?

26. Supposing the time to be between ten and eleven, and that the hour and minute hands are exactly at right angles to each other, what is the correct time?

27. Sound travels through the air at the rate of 1142 feet per second; I observe a flash of lightning, and after 6 strokes of my pulse hear the thunder; if my pulse makes 68 strokes in a minute, how far off is the thunder?

28. The driving wheel of a locomotive engine was $21\frac{1}{4}$ feet in circumference, and turned 90 times in a minute; now if, on a certain day, this wheel slipped $\frac{1}{3}$ th part of its circumference each turn, at what rate per hour did the engine move?

29. After using $\frac{2}{3}$ of a Lent cheese, $\frac{2}{3}$ of the remainder sold for 13s. $5\frac{1}{2}$ d.; what was the worth of the whole cheese?

30. A gentleman throws a number of coins, which consist of sovereigns, shillings, and pence, amongst three boys, *A*, *B*, and *C*. In the scramble

<i>A</i> gathers	$\frac{1}{2}$ the gold,	$\frac{1}{4}$ the silver,	and	$\frac{1}{8}$ the pence;
<i>B</i> ...	$\frac{1}{8}$...	$\frac{1}{8}$...	and	$\frac{1}{4}$...
<i>C</i> ...	$\frac{1}{4}$...	$\frac{1}{8}$...	and	$\frac{1}{8}$...

find how much each gathers, and the whole sum, supposing one sovereign, one shilling, and one penny to remain unobserved.

31. In a match of cricket, a side of eleven men gained a certain number of runs; one player obtained $\frac{1}{3}$ of the number; each of two others $\frac{1}{10}$; each of three others $\frac{1}{20}$; and the rest made up between them 63 runs; what was the whole number of runs? and what was the score of each man, supposing that 4 of the last 5 players scored 5 times as much as the other?

32. A working man found some ancient coins; but as he carried them home he lost $\frac{1}{4}$ of them, had his pocket picked of $\frac{2}{3}$ of the remainder, and paid a debt with $\frac{2}{3}$ of what he had left; after which he found that he had only 10 remaining: how many did he find?

33. A person dies worth £10,000, and leaves $\frac{1}{3}$ of his property to his wife, $\frac{1}{2}$ to his son, and the rest to his daughter. The wife at her death leaves $\frac{2}{3}$ of her legacy to the son, and the rest to the daughter; but the son adds his fortune to his sister's, and gives her $\frac{1}{3}$ of the whole. How

much will the sister gain by this? and what fraction will her gain be of the whole?

34. Write in descending order of magnitude the following fractions : $\frac{1}{2}$, $\frac{3}{8}$, $\frac{7}{10}$, $\frac{13}{20}$, $\frac{5}{12}$, $\frac{19}{30}$, $\frac{11}{20}$, and $\frac{32859}{88888}$.

35. Of the sovereigns who have reigned in England since the Norman Conquest, there are $\frac{1}{3}$ th of one name, $\frac{2}{3}$ ths of another, $\frac{1}{12}$ th of another, $\frac{1}{3}$ th of each of two others, and $\frac{1}{15}$ th of each of three others, and there are 5 besides; hence determine how many sovereigns have reigned in England since the Conquest.

36. Is $\frac{4}{21}$ more nearly equal to $\frac{1}{3}$ or to $3\frac{1}{2} - 2\frac{2}{11} + \frac{1\frac{1}{2}}{3\frac{1}{2}}$ of $2\frac{1}{3} - 1\frac{1}{2}$, and by how much?

37. A man pays away $\frac{1}{4}$ th of his money, then $\frac{1}{3}$ rd of what remains, and then $\frac{2}{3}$ ths of the second remainder, after which he has 7s. 6d. remaining; how much had he at first?

38. A ship and cargo are together worth £10892 9s. 6d.; the ship is worth $\frac{2}{3} + \frac{1}{15}$ of $\frac{7}{16} - \frac{1}{60}$ of the whole; find the value of $\frac{1}{11}$ of the cargo.

39. When $\frac{1}{5}$ of $\frac{3}{16} + \frac{9}{7}$ of $\frac{47}{65\frac{1}{2}}$ of its contents were taken out of a purse, there remained £3 12s. 9 $\frac{1}{2}$ d.; how much did the purse contain at first?

40. Allowing that 44 $\frac{1}{2}$ guineas weigh a pound Troy, and 32 halfpence weigh a pound Avoirdupois, what is the difference in grains between the weights of a guinea and a halfpenny?

41. A met two beggars B and C; and having with him $\frac{3\frac{7}{11}}{4\frac{1}{2}}$ of $\frac{10\frac{5}{7}}{7\frac{1}{2}}$ of $\frac{77}{840}$ of a moidore, gave B $\frac{1}{7}$ of $\frac{3}{4}$ of that sum, and C $\frac{2}{3}$ of the remainder; what did each receive?

42. A man pays a corn-rent of 5 quarters of wheat and 3 of barley, Winchester measure; what is the value of his rent, wheat being at 60s. and barley at 54s. per quarter, Imperial measure, supposing an Imperial gallon to be equal to $3\frac{3}{4}$ of a Winchester gallon?

43. Sound travels at such a rate that the report of a gun known to be $4\frac{1}{2}$ miles distant is heard $20\frac{49}{11}$ seconds after the flash is seen, and the velocity of light is $887705\frac{4}{11}$ times that of sound; how far does light travel in a second? Also how far off is that star from which light takes $1205\frac{3}{4}$ days to reach the earth?

DECIMAL FRACTIONS.

Ex. XXVII.—ADDITION.

1. $303\cdot303 + 172\cdot172 + \cdot0606 + 23 + 27\cdot4274$.
2. $\cdot005 + \cdot0027 + 21\cdot005 + 30\cdot0486 + 74\cdot0637$.
3. $3456\cdot709 + 345\cdot6709 + 34\cdot56709 + 3\cdot456709$.
4. $3\cdot4267 + 426\cdot3 + 1273 + 5\cdot2833 + 27\cdot51843$.
5. $\cdot0985 + 3\cdot456 + 2\cdot02 + 119 + \cdot000296 + 4\cdot5210007$.
6. $3\cdot1246 + 125 + \cdot0003 + 2\cdot237 + 406\cdot5 + 7\cdot2084$.
7. $74\cdot0367 + \cdot0000526 + 8 + 3\cdot973 + 47\cdot5 + \cdot2854$.
8. $1\cdot25 + 2347 + \cdot067 + 23\cdot8 + \cdot4760009 + 2\cdot86321$.
9. $\cdot0042165 + \cdot937 + 4000 + \cdot000625 + 1\cdot2013 + \cdot001$.
10. $\cdot024 + \cdot75 + 43 + \cdot000417 + 2\cdot0168 + \cdot913$.
11. $\cdot99987 + 42\cdot898792 + \cdot9847 + 987\cdot099 + \cdot9989$.
12. $2\cdot007 + \cdot048001 + \cdot01 + 567\cdot2 + \cdot90400657 + 17\cdot84651$.

Ex. XXVIII.—SUBTRACTION.

- | | |
|----------------------------------|--|
| 1. $\cdot1 - \cdot01$. | 6. $17\cdot30185 - \cdot851476$. |
| 2. $1\cdot03 - \cdot1073$. | 7. $269\cdot34 - 17\cdot98765$. |
| 3. $1 - \cdot00001$. | 8. $63\cdot5 - 2\cdot0000427$. |
| 4. $30\cdot7265 - \cdot007598$. | 9. $29\cdot085763218 - 7\cdot045$. |
| 5. $912 - \cdot71836$. | 10. $9\cdot015 - 5\cdot108700684938$. |
11. $3\cdot468 + 6\cdot13 - \cdot00416$.
 12. $63\cdot5507 - 26\cdot413 + \cdot0463$.
 13. $45\cdot007 - 2\cdot6189 - 11\cdot99986$.
 14. $27\cdot614586 + 1\cdot0008 - 17\cdot081540965$.
 15. $2\cdot36809 - 17\cdot265008 + 22\cdot5$.
 16. $108\cdot62 + 3\cdot801 - \cdot1007 - 17\cdot365$.
 17. $327\cdot1006 - 18\cdot715 - 92\cdot00004 - \cdot100063$.
 18. $101\cdot010101 - 22\cdot0202 + 675\cdot675 + 18\cdot18$.
 19. $45\cdot632 + \cdot007814 - 19\cdot650008 + 81\cdot1$.
 20. $17\cdot284 - 5\cdot000601 + 2\cdot354 - 10\cdot000009$.

Ex. XXIX.—MULTIPLICATION.

- | | |
|-------------------------------------|--------------------------------------|
| 1. $1\cdot525 \times 80\cdot08$. | 4. $\cdot007853 \times \cdot00476$. |
| 2. $192\cdot8 \times \cdot01928$. | 5. $\cdot03162 \times \cdot00146$. |
| 3. $\cdot2365 \times \cdot002435$. | 6. $17\cdot514 \times 6\cdot593$. |

7. 4·5234 × 1·003.	14. ·002576 × ·038.
8. ·78539 × ·076.	15. ·1 × ·1 × ·1 × ·1 × ·1 × ·1.
9. 32·007 × 7·06.	16. ·1 × ·2 × ·3 × ·4 × ·5 × ·6.
10. 7·2416 × 6·214.	17. ·012 × ·035 × 50·1.
11. ·0010102 × 109·01.	18. 3·417 × ·0249 × ·0007.
12. 21·32 × ·100406.	19. ·007853 × ·00476 × 300.
13. 13·0426 × 8·3924.	20. 72·0376 × 3·5981 × ·02.

EX. XXX.—DIVISION.

1. 7·53 ÷ 2·5.	21. 48 ÷ ·002.
2. 144 ÷ ·192.	22. 250 ÷ ·000035.
3. ·0022675 ÷ ·907.	23. 87·9288 ÷ 7·3.
4. 4·63638 ÷ 81·34.	24. 7·6394 ÷ 2·2.
5. 15·4546 ÷ ·019.	25. ·000035 ÷ 250.
6. ·429408 ÷ 59·64.	26. ·04 ÷ ·0082.
7. ·034 ÷ 2·14.	27. 3·07930896 ÷ ·0378.
8. 50·08747 ÷ 270·56.	28. ·0125 ÷ 7·4.
9. 3·717184 ÷ ·000048.	29. ·16 ÷ ·0042.
10. 122·122 ÷ ·000625.	30. 670 ÷ ·0015.
11. 21·58821 ÷ ·000246.	31. 34·17 ÷ 3·25.
12. 12·34 ÷ ·027.	32. 2147·04 ÷ ·036.
13. 12·34 ÷ 27.	33. 377·978 ÷ ·0017.
14. 12·34 ÷ ·000027.	34. 4·63638 ÷ 81·34.
15. 7·72 ÷ ·297.	35. 17·084592 ÷ ·024.
16. 4·8 ÷ ·00016.	36. ·00071012 ÷ 1·732.
17. ·0281849 ÷ ·00081849.	37. ·94373 ÷ ·92841.
18. 2·763 ÷ ·9.	38. ·234567 ÷ ·123456.
19. 1·577063 ÷ ·673.	39. ·31742 ÷ ·28398.
20. 72 ÷ 1·000005.	40. 1138·47 ÷ 125000.

41. 24·01 × ·0039 ÷ 133·77.
 42. ·049 × 3·417 ÷ ·0007.
 43. ·0001416 × ·0012167 ÷ ·0000000125.
 44. ·000785 ÷ ·0005 — ·000075 ÷ 15.
 45. (3·124 + 1·25) × (2·237 — ·026) ÷ ·0003.
 46. (4·32 + 3·179) × (4·32 — 3·179) ÷ ·009.

REDUCTION OF VULGAR FRACTIONS TO DECIMALS.

Ex. XXXI.

Reduce to Decimals :

1. $7\frac{51}{120}$.	5. $1\frac{67}{40}$.	9. $184\frac{1}{3184}$.
2. $5\frac{1}{16}$.	6. $6\frac{8}{5120}$.	10. $87\frac{3}{8432}$.
3. $11\frac{99}{125}$.	7. $3\frac{177}{1250}$.	11. $882\frac{9}{3741}$.
4. $9\frac{191}{25000}$.	8. $1\frac{7}{280}$.	12. $96\frac{1}{481}$.
13. $1\frac{4}{110}$.	17. $\frac{31}{42}$.	22. $\frac{50}{21}$.
14. $8\frac{7}{27}$.	18. $6\frac{5}{32}$.	23. $1\frac{4111}{33300}$.
15. $17\frac{1}{1100}$.	19. $2\frac{423}{5550}$.	24. $\frac{11}{67\frac{1}{2}}$.
16. $14\frac{5}{14}$.	20. $6\frac{3101}{33000}$.	
	21. $20\frac{273}{11250}$.	

$$25. \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32}.$$

$$26. \frac{1}{3} + \frac{1}{6} + \frac{1}{14} + \frac{1}{56}.$$

$$27. \frac{247}{7} + \frac{1512}{108} + \frac{17}{7\frac{1}{2}} + 200\frac{7}{10} + \frac{11}{325}.$$

$$28. 2 + \frac{1}{1.2} + \frac{1}{1.2.3} + \frac{1}{1.2.3.4} + \dots$$

$$29. 16 \left\{ \frac{1}{5} - \frac{1}{3.5^3} + \frac{1}{5.5^5} - \frac{1}{7.5^7} \right\} - \frac{4}{239}$$

$$30. \frac{1}{2} + \frac{1}{3.2^3} + \frac{1}{5.2^5} + \frac{1}{7.2^7} + \dots$$

REDUCTION OF DECIMALS TO VULGAR FRACTIONS.

Ex. XXXII.

Reduce to Vulgar Fractions :

1. .13125.	5. 12.96875.	9. 2.738128.
2. .00234375.	6. 2.301125.	10. 27.0028125.
3. .00390625.	7. 17.0008275.	11. 14.0000625.
4. .0019140625.	8. 5.007352.	12. 3.0007875.

13. $\dot{3}$.	21. $6\dot{2}8571\dot{4}$.	29. $27\dot{0}27$.
14. $\dot{1}\dot{3}$.	22. $17\cdot12\dot{3}4\dot{5}$.	30. $1\dot{4}2857\dot{1}$.
15. $\dot{2}\dot{9}$.	23. $9\cdot00\dot{1}\dot{3}$.	31. $3\cdot4275\dot{3}$.
16. $4\cdot08\dot{3}$.	24. $25\cdot423\dot{7}$.	32. $2\cdot0063\dot{7}$.
17. $\dot{1}2\dot{6}$.	25. $14\cdot52\dot{6}$.	33. $\dot{3}76923\dot{0}$.
18. $\dot{5}7\dot{3}$.	26. $3\cdot0045\dot{7}$.	34. $4\cdot00743\dot{2}$.
19. $\dot{9}12\dot{6}$.	27. $2\cdot000036300\dot{5}$.	35. $64\cdot00782\dot{1}$.
20. $3\cdot270\dot{1}\dot{3}$.	28. $7\cdot0007692\dot{3}$.	36. $45\cdot0712\dot{1}$.

ADDITION OF RECURRING DECIMALS.

Ex. XXXIII.

- $\dot{1}8694\dot{7} + 2\cdot30\dot{4} + 191\cdot7\dot{1} + \dot{6}7 + 14\cdot793\dot{6} + 892$.
- $\dot{0}769 + 14\cdot00\dot{3} + 6\cdot7\dot{2} + \dot{4}8\dot{2} + 108\cdot563\dot{1} + 2\cdot9$.
- $2\cdot\dot{3}47\dot{8} + 19\cdot86\dot{3} + 200\cdot000\dot{6} + 2\cdot\dot{3} + 746\cdot389\dot{7} + 1\cdot9234\dot{5}$.
- $1\cdot2\dot{3}7\dot{8} + 6\cdot1\dot{9} + 192\cdot325\dot{6} + \dot{6}1 + \dot{8}3\dot{4} + \cdot000\dot{2}$.
- $16\cdot00\dot{3} + 7\cdot20\dot{9} + 104\cdot472\dot{1} + 100\cdot376984\dot{2}$.
- $3456\cdot709 + 345\cdot670\dot{9} + 34\cdot5670\dot{9} + 3\cdot45670\dot{9}$.
- $3\cdot426\dot{7} + 426\cdot\dot{3} + \cdot007\dot{5} + 5\cdot283\dot{3} + 27\cdot5184\dot{3}$.
- $63\cdot550\dot{7} + \dot{0}46\dot{3} + 1\cdot41\dot{3} + \cdot006 + 950\cdot706\dot{5}$.
- $2\cdot13025\dot{7} + 21\cdot3025\dot{7} + 213\cdot025\dot{7} + 2130\cdot257$.
- $\dot{1}38 + \dot{1}4679\dot{3} + 276 + 24\cdot137\dot{2} + \cdot0054 + 5\cdot217\dot{8}$.
- $\cdot00849713\dot{3} + 44\cdot8\dot{5} + 3\cdot02\dot{6} + 1075 + \cdot543\dot{2} + 2\cdot417\dot{3}$.
- $2\cdot7506\dot{8} + 3074\cdot254 + 1\cdot2587\dot{3} + 60\cdot4 + 1\cdot234\dot{0}$.

SUBTRACTION OF RECURRING DECIMALS.

Ex. XXXIV.

- | | |
|--|--|
| 1. $13\cdot12\dot{7} - 7\cdot007386\dot{1}$. | 7. $7\cdot46\dot{2} - 7\cdot46\dot{2}$. |
| 2. $108\cdot563\dot{1} - \dot{4}8\dot{2}$. | 8. $\dot{1}942 - \dot{0}87653\dot{1}$. |
| 3. $87\cdot7523489\dot{1} - 19\cdot83218\dot{4}$. | 9. $3\cdot004\dot{5} - 1\cdot100046275\dot{1}$. |
| 4. $201\cdot21422167\dot{6} - 100\cdot374986\dot{3}$. | 10. $8\cdot2478 - 1\cdot0056\dot{2}$. |
| 5. $1101\cdot68002\dot{1} - 100\cdot680\dot{1}$. | 11. $7\cdot321\dot{4} - 1\cdot20\dot{7}$. |
| 6. $176\cdot458863\dot{2} - 14\cdot37\dot{3}$. | 12. $13\cdot37867239\dot{7} - 4\cdot00863215\dot{7}$. |

13. $3\cdot46\dot{8} + 6\cdot1\dot{3} - 9\cdot59\dot{7}8560\dot{3}$.
14. $63\cdot550\dot{7} - 37\cdot183\dot{7}2800\dot{0} + \cdot04\dot{6}\dot{3}$.
15. $\cdot7\dot{1}2\dot{5} + 6\cdot\dot{7}5\dot{7} - 6\cdot66\dot{4}6473\dot{7}$.
16. $32\cdot16\dot{6}5863\dot{1} - 9\cdot00\dot{0}\dot{6} - 18\cdot04\dot{2}857\dot{1}$.
17. $44\cdot6356238\dot{0} - 1\cdot00\dot{2} - 15\cdot9\dot{1}\dot{3} - 17\cdot1\dot{1}\dot{6}$.
18. $99\cdot701\dot{2} + 19\cdot40\dot{3} - 63\cdot849\dot{2}13\dot{7} + 6\cdot2\dot{1}86\dot{5}$.

MULTIPLICATION OF RECURRING DECIMALS.

Ex. XXXV.

- | | |
|---|---|
| 1. $2\cdot3\dot{6}4\dot{8} \times 2\cdot14$ | 7. $16\cdot200\dot{7}\dot{5} \times 8\cdot914$ |
| 2. $6\cdot7073\dot{1} \times 2\cdot34$ | 8. $1\cdot000\dot{1} \times \cdot0908\dot{1}$ |
| 3. $5\cdot2\dot{1}84\dot{6} \times 18\cdot5$ | 9. $2\cdot89\dot{6}430\dot{2} \times 80\cdot213$ |
| 4. $8\cdot04761\dot{9} \times 3\cdot29$ | 10. $1\cdot12\dot{3}456\dot{7} \times 6\cdot047\dot{1}$ |
| 5. $7\cdot2\dot{5}\dot{9} \times 1\cdot23$ | 11. $8\cdot00728\dot{3} \times 2\cdot1700\dot{5}$ |
| 6. $6\cdot391782\dot{5} \times 6\cdot924$ | 12. $4\cdot61\dot{5}04 \times 31\cdot0000\dot{5}$ |
| 13. $\cdot\dot{1} \times \cdot00\dot{9}$ | 19. $\cdot\dot{2}\dot{1} \times \cdot171428\dot{5}$ |
| 14. $5\cdot8\dot{1} \times \cdot458\dot{3}$ | 20. $\cdot67\dot{2} \times \cdot0118\dot{9}$ |
| 15. $\cdot2\dot{9} \times \cdot01\dot{3}$ | 21. $\cdot1283\dot{7} \times 2\cdot522\dot{7}$ |
| 16. $49\cdot\dot{3} \times \cdot2995\dot{4}$ | 22. $\cdot44\dot{1} \times \cdot6785714\dot{2}$ |
| 17. $\cdot2\dot{6} \times \cdot708\dot{3}$ | 23. $\cdot376923\dot{0} \times \cdot035\dot{4}$ |
| 18. $3\cdot1\dot{4} \times 2\cdot0063\dot{7}$ | 24. $\cdot705357142\dot{8} \times 6\cdot1582278481012\dot{6}$ |

DIVISION OF RECURRING DECIMALS.

Ex. XXXVI.

- | | |
|--|---|
| 1. $\cdot3\dot{8} \div \cdot3$ | 7. $\cdot17948\dot{7} \div \cdot53846\dot{1}$ |
| 2. $\cdot2\dot{7} \div \cdot31\dot{8}$ | 8. $\cdot0269230\dot{7} \div \cdot15384\dot{6}$ |
| 3. $1\cdot9 \div \cdot14285\dot{7}$ | 9. $\cdot01831\dot{5} \div \cdot00447\dot{7}$ |
| 4. $\cdot000\dot{7} \div \cdot02\dot{1}$ | 10. $2\cdot1659\dot{5} \div \cdot04$ |
| 5. $2\cdot29\dot{7} \div 7\cdot7\dot{2}$ | 11. $411\cdot351\dot{9} \div 58\cdot764\dot{5}$ |
| 6. $77\cdot6724\dot{0} \div 9\cdot42\dot{6}$ | 12. $\cdot28571\dot{4} \div \cdot30769\dot{2}$ |

13. $3\cdot4267 \times \cdot013 \div \cdot142857$.
14. $\cdot02 \times 6\cdot00207 - 2\cdot43812 \div 33\cdot4$.
15. $(7\cdot462 - 11\cdot714 + 6\cdot314) \div (7\cdot563 - 7\cdot563)$.

VALUATION OF CONCRETE DECIMALS.

Ex. XXXVII.

Find the value of

1. $\cdot8125$ of £1; and $\cdot2135$ of £7 16s. 10d.
2. $4\cdot6875$ of a cwt., and $\cdot1080078125$ of a ton.
3. $1\cdot7962$ of £7, and also of £6 13s. 4d.
4. $3\cdot97216$ of £20, and also of £11 9s. 6d.
5. $12\cdot3475$ of 1 ton, and also of 1 ton. 2 cwt. 3 qrs.
6. $9\cdot1257$ of 4 miles, and also of 3 miles 0 fur. 21 po. $4\frac{1}{2}$ yds.
7. $18\cdot6392$ of 9 oz. Troy, and also of 1 lb. 4 oz. 15 dwts.
8. $\cdot70323$ of £1 — $3\cdot5646$ of 1s.
9. $22\cdot4735$ of £1 — $17\cdot2845$ of a guinea.
10. $\cdot45$ of £5 10s. — $\cdot0125$ of £4 13s. 4d. + $\cdot0375$ of £3.
11. $12\cdot789$ of a ton. + $2\cdot98$ of a cwt. — $13\cdot005$ of a lb.
12. $\cdot0057$ of £1 + $9\cdot245$ of 5s. 6d. — $1\cdot26$ of 2s. 3d.
13. $\cdot65$ of £3 10s. + $\cdot3$ of £2 3s. — $\cdot2063$ of £4 6s. 9d.
14. $\cdot6$ of a ton + $\cdot4$ of a cwt. + $\cdot666$ of a lb.
15. $\cdot375$ of $2\frac{1}{2}$ cwt. + $\cdot523$ of 1 cwt. 1 qr. 14 lbs. + $\cdot75$ of $3\frac{1}{2}$ lbs.
16. $4\cdot37$ acres + $652\cdot7$ roods — $239\cdot87$ half-yards.
17. $2\cdot123$ of £1, and $\cdot234$ of £20.
18. $\cdot440625$ of £1, and $5\cdot36267$ of a guinea.
19. $29\cdot530588194$ of a day, and $\cdot7882571428$ of a week.
20. Convert into pounds, shillings, and pence :

(1) £105 1 florin 4 cents 5 mils.	(4) £27 3 florins 6 cents 5 mils.
(2) £6 1 florin 7 cents 5 mils.	(5) £15 3 florins 1 cent $2\frac{1}{2}$ mils.
(3) £12 6 florins 2 cents 5 mils.	(6) £8 1 florin 0 cent $6\frac{1}{2}$ mils.

TO EXPRESS ONE QUANTITY AS A DECIMAL OF ANOTHER.

Ex. XXXVIII.

1. Express 12s. $6\frac{3}{4}d.$ as a decimal of £1, and also of £2 12s. 6d.
2. Express 18s. $4\frac{1}{2}d.$ as a decimal of £6, and also of £6 6s. 6d.
3. Express £3 11s. $9\frac{3}{4}d.$ as a decimal of £1, and also of £2 10s.
4. Express £2 13s. $4\frac{1}{2}d.$ as a decimal of £9, and also of £9 9s. 9d.
5. Express £2 15s. $2\frac{1}{4}d.$ as a decimal of £10, and also of £9 16s. 8d.
6. Reduce 13s. $6\frac{1}{2}d.$ to the decimal of a guinea.
7. Reduce £3 6s. $8\frac{1}{2}d.$ to the decimal of £7 10s.
8. Reduce 7s. $8\frac{1}{10000}d.$ to the decimal of half-a-guinea.
9. What decimal of a guinea is £5 16s. $3\frac{3}{8}d.$?
10. What decimal of 2s. 6d. is £2 8s. 1·518d.?
11. Reduce ·2835 of £1 to the decimal of a guinea.
12. What decimal of a year is equivalent to a day?
13. What decimal of £3 16s. $10\frac{1}{2}d.$ is equal to £2 17s. $6\frac{1}{2}d.$
14. Reduce $2\frac{3}{10}$ inches to the decimal of a mile, and 7 ft. $5\frac{1}{4}$ in. to the decimal of a furlong.
15. What decimal of a month will represent 3 weeks 4 days 5 hours 6 minutes 7 seconds?
16. Express 17 cwt. 0 qr. 23 lbs. as a decimal of 1 ton, and also of 2 tons. 1 cwt. 3 qrs.
17. Express 36 miles 2 furlongs 21 poles $4\frac{1}{2}$ yards as a decimal of 4 miles, and also of 3 miles 13 poles $1\frac{1}{2}$ yard.
18. Express 10 tons 15 cwt. 3 qrs. 14 lbs. as a decimal of 25 tons, and also of 12 tons 16 cwt. 10 lbs.
19. Express 17 lbs. 5 oz. 16 dwts. 20 grs. as a decimal of 100 lbs., and also of 100 lbs. 7 oz. 18 dwts.
20. What decimal of a ton will represent 16 cwt. 3 qrs. $17\frac{3}{8}$ lbs.?
21. What decimal of £5 is equivalent to $\frac{2}{3}$ of 25s.
22. Convert into decimal coinage,

(1) $7\frac{1}{2}d.$	(7) £100 14s. 6d.
(2) £24 15s.	(8) £12 3s. 6d.
(3) £41 8s. 9d.	(9) £19 2s. 6d.
(4) £7 9s. $3\frac{3}{8}d.$	(10) £58 6s. $1\frac{1}{2}d.$
(5) £3 14s. $5\frac{1}{2}d.$	(11) £16 5s. $1\frac{1}{8}d.$
(6) £8 12s. $3\frac{3}{8}d.$	(12) £11 5s. $2\frac{1}{8}d.$

MISCELLANEOUS EXAMPLES IN DECIMALS.

Ex. XXXIX.

1. Express in a decimal form :

$$(1) \quad 2 + \frac{4}{5} + \frac{7}{1000} + \frac{16}{20000}$$

$$(2) \quad 17 + \frac{16}{800} + \frac{1}{125} + \frac{18}{200000}$$

$$(3) \quad \cdot 0742 + \frac{13}{625} - \frac{9}{400}$$

2. Multiply seven millionths, seven thousandths, and seventy, by six millionths, three hundredths, and ninety; and divide the product by two millionths, one hundredth and thirty.

3. Multiply eight thousand, two tenths, and eight hundred-thousandths by five hundred, three tenths, and four thousandths; and divide the product by nine thousand and five + four hundred and seventy-two thousandths.

4. Multiply the sum of $\cdot 2\cdot 016$ and $\cdot 2016$ by $\cdot 02016$, and divide the product by $\cdot 27$.

5. Find the quotient of $\frac{4}{11} + \frac{5}{12} - \frac{2}{14} + \frac{1}{15}$ divided by $\cdot 0036625$, to 7 places of decimals.

6. Required the vulgar fraction equivalent to $\cdot 83 + \cdot 63 + \cdot 73$.

7. What is the value of $\frac{2}{3}$ of $\cdot 709$ of $\cdot 6$ of $\frac{3}{4}$ of $\frac{2}{3}$ of £7 13s. 6½d.?

8. Multiply 3·45 of £5 10s. by 7·5.

9. Reduce $\frac{2}{3}$ of $\cdot 571428$ of 115 dollars, each 4s. 3¼d. to the fraction of $\cdot 8$ of $\frac{3}{4}$ of 161 crown pieces.

10. Multiply 21 acres, 3 roods, 17 perches by $\cdot 02$.

11. What is the price of 284·8665 bushels of wheat at 7s. 0¼d. per bushel?

12. Reduce 4156 lbs. 10 oz. 11 dwts. to cwts. Avoirdupois, and a decimal.

13. Divide 1·6 by 2, $\cdot 2$ and $\cdot 00002$, and find the product of the quotients.

14. There are two fractions, viz. $\frac{113}{167}$ and $\frac{113}{178}$; also two others, viz. $\frac{238}{228}$ and $\frac{255}{228}$; find the product of the smaller fraction in each couple, and take this part of $\cdot 07426$ from the product of $\cdot 125$ and $7\cdot 162$.

15. Write in order of magnitude, beginning with the least, $\frac{1}{17}$, $\frac{1}{2}$, $\cdot 87$, $\frac{2}{3}$, 1, $\cdot 59$, $\frac{3}{10}$.

16. Reduce $\pounds \frac{.036}{1875}$ to the fraction of a farthing, and divide $\pounds 36$ by $.001875$?

17. Find the value of $.9076$ of $\pounds 51$ 14s. $10\frac{1}{2}d.$ in guineas and the decimal of a guinea?

18. What is the least multiple of $3.4298\bar{6}$, that is a finite decimal?

19. If $\pounds 1 = 10$ florins = 100 cents = 1000 mils, add together $\pounds 78$ 5 fl. 3 c. 7 m.; $\pounds 64$ 4 fl. 2 c. 8 m.; and $\pounds 5$ 9 fl. 5 c. 6 m.

20. Find the difference between $\pounds 18$ 2 fl. 3 c. 9 m. and $\pounds 6$ 4 fl. 5 m., expressing the result in pounds, shillings, &c.

21. Multiply $\pounds 7$ 6 fl. 3 c. 5 m. by 47.4 ; and divide $\pounds 892$ 2 fl. 3 c. $5\frac{1}{10}$ m. by 48.5 .

22. Simplify the following expressions:

$$(1) \quad \frac{3}{7} \text{ of } \frac{17.48}{2.7} \times \frac{.034}{.0038} + \frac{2\frac{3}{4}}{1\frac{1}{2}} \text{ of } 3.4\bar{5}.$$

$$(2) \quad 3.25 - \frac{7.25 - 5.5}{4\frac{7}{8} - 2\frac{3}{8}} + .875 \text{ of } \frac{2.75}{6.3}$$

$$(3) \quad \frac{.005}{\frac{2}{3} \text{ of } 13\frac{1}{2}} \text{ of } \frac{26.25}{\frac{3}{4} \text{ of } 2.75}$$

$$(4) \quad \frac{7\frac{1}{2} \times 3\frac{3}{8}}{.75 \times 36.6} + \frac{2.3 \text{ of } 15}{2\frac{2}{3} \text{ of } 3\frac{1}{4}} + \frac{7.25}{11\frac{3}{8}}$$

$$(5) \quad 2 + \frac{25}{.625} + \frac{.05}{\frac{1}{20} \text{ of } .05} - \frac{.025}{\frac{1}{2} \text{ of } \frac{9}{16}}$$

$$(6) \quad \frac{2.75 \times .523809}{6.6 \times 1.571428} + \frac{1.27}{.127} - \frac{2.005}{601.5}$$

23. Find the difference between $\frac{4.76 + 5.81 - 2.5}{4.76 \text{ of } 32 \text{ of } .45}$ and $\frac{9}{16}$ of $\frac{7}{7}$ of $.875$.

24. What decimal must 15 be multiplied by, in order that the product may equal $\frac{2}{3}$?

25. Express $\frac{2\frac{2}{3} + 5.27}{2\frac{1}{3} \text{ of } 5\frac{7}{11}}$ of $\pounds 25$ as a fraction of $\frac{3.7 \text{ of } 2.25}{4.4583 + 7.16}$ of $\pounds 20$.

26. The true length of the year is 365.24224 days; find what the error amounts to by the common reckoning in four centuries.

27. What fraction of $\frac{\frac{1}{2} \text{ of } 2\frac{1}{3}}{2.36 + 1.7}$ of $\pounds 3$ 10s. is $\frac{4.03 - 3.3}{2\frac{2}{3} \text{ of } 3\frac{1}{4}}$ of $\pounds 1$?

28. Given that the circumference of a circle is 3·14159 times its diameter; find in feet and inches the diameter of a cylinder whose circumference is 14 ft. $11\frac{1}{2}$ inches.

29. The length of a French metre is 39·371 inches, and it equals the forty-millionth part of the circumference of the earth; find the circumference of the earth in miles.

30. If 66 shillings weigh a pound Troy, find the exact weight of a shilling, reducing the result to the decimal of a dwt.

31. The French metre containing 39·371 English inches, how many English yards are contained in 32 metres?

32. Goliath is said to have been $6\frac{1}{2}$ cubits high; what was his height estimated in feet and inches, considering the cubit equivalent to 19·168 inches?

33. The length of $\frac{1}{380}$ th of the earth's circumference is 69·045 miles nearly, and the circumference is 3·14159 times the diameter; find the length of the earth's diameter in miles.

34. A quadrant of the meridian in French metres is 10000565·278, and a metre is 39·371 English inches; find the length of the quadrant in English feet.

35. The number of degrees in an arc of a circle which is equal to the radius is 57·29578; required the number of seconds in the same.

36. A sidereal day is 23 hours, 56 minutes, and the mean solar day is 24 hours; reduce the difference between the two to the decimal of a sidereal day.

37. A gallon of pure water weighs 10 lbs. Avoirdupois, and measures 277·274 cubic inches; find the weight of a cubic foot of water, and the number of gallons in half a cubic yard of water.

38. Lead being 11·325 times as heavy as water, find the weight of a cubic foot of lead in lbs. and a decimal. (See preceding question.)

39. If the length of a pendulum vibrating seconds be divided into 12231 equal parts, the yard is equal to 11250 of these parts; find the length of the second's pendulum in inches and decimal parts of an inch.

40. Given that the mean distance of the Sun from the Earth $= \frac{3420·9}{8·57} \times$ distance of the Moon from the Earth; also the distance of the Moon from the Earth $= 60·28 \times$ the radius of the Earth, and the radius of the Earth $= 3962·8$ miles; hence find the mean distance of the Sun from the Earth in miles.

PRACTICE.

Ex. XL.—CASE I.

Find the value of

1.	1172 articles at	18s. 10d. each.
2.	34268 ...	7s. 9d. „
3.	3938 ...	5s. 9d. „
4.	805 ...	£3 12s. 7½d. „
5.	14764 ...	£1 17s. 8½d. „
6.	1684 ...	£8 5s. 1½d. „
7.	11228 ...	£7 7s. 2¾d. „
8.	12357 ...	£19 19s. 10¼d. „
9.	16338 ...	£11 9s. 9¾d. „
10.	12548 ...	£37 17s. 11¼d. „
11.	102286 ...	£14 13s. 3¾d. „
12.	13815 ...	£2 14s. 1½d. „
13.	13456 ...	£1 7s. 6d. „
14.	442875 ...	£1 19s. 2½d. „
15.	8216½ ...	£4 0s. 2⅛d. „
16.	5416¼ ...	10¾d. „
17.	131⅞ ...	£2 13s. 6⅜d. „
18.	39⅞ ...	£1033 7s. 0¾d. „
19.	2763⅔ ...	13s. 6¼d. „
20.	785¼ ...	£1 17s. 6d. „
21.	5287⅞ ...	£3 5s. 7½d. „
22.	5031⅝ ...	£7 12s. 8½d. „
23.	14857¾ ...	£2 9s. 10¼d. „
24.	24020⅞ ...	£2 14s. 11¼d. „

Ex. XLI.—CASE II.

Find the value of—

1. 3 tons 5 cwt. 4 lbs. at £3 17s. per cwt.
2. 20 acres 3 roods 25 poles, at £5 7s. 6½d. per acre.
3. 7 qrs. 3 bushels 3½ pecks, at 7s. 4d. per bushel.
4. 1461 lbs. 3 oz. 5 dwts. at £50 14s. per lb.
5. 191 acres 3 roods 37 poles at £42 3s. 4d. per acre.
6. 89 cwt. 3 qrs. 6 lbs. at £3 15s. 4d. per cwt.
7. 67 cwt. 2 qrs. 8 lbs. at £5 6s. 3d. per cwt.

8. 843 yards 2 ft. 10 in. at £2 11s. 3d. per yard.
9. 4029 qrs. 6 bus. 5 gals. at £3 3s. 4d. per quarter.
10. 45 acres 2 qrs. 27 poles, at £48 12s. 6d. per acre.
11. 17 cwt. 1 qr. 12 lbs. at £1 19s. 8d. per cwt.
12. 356 acres 3 roods 39½ poles, at £2 13s. 4d. per acre.
13. 46 quarters, 5 bus. 2 pks. 1 gal. at £2 18s. 8d. per quarter.
14. 2 lbs. 6 oz. 13 dwts. 10 grs. at £1 9s. 2d. per ounce.
15. 7 cwt. 2 qrs. 17½ lbs. at £3 15s. 4½d. per quarter.
16. 28 yards 2 qrs. 1¼ nails, at £1 11s. 1½d. per yard.
17. 87 E. ells 3 qrs. 2 nails, at £3 10s. 6d. per E. ell.
18. £3428 16s. 3½d. at 12s. 7½d. per pound.
19. 76 lbs. 9 oz. 10 dwts. at 18 dwts. 12 grs. per pound.
20. £1710 14s. 6d. at £1 13s. 4½d. per pound.
21. What is the rent of 38 acres 2 ro. 30 poles, at 2 guineas per acre.
22. What is the value of 42 acres 2 ro. 10 poles, at £100 5s. per acre.
23. Required the price of 15 cwt. 3 qrs. 16 lbs. at £2 17s. per cwt.
24. What is the dividend on £913 18s. 4¼d. at 16s. 3d. in the pound.
25. Find the price of 19 qrs. 7 bus. 3½ pks. of wheat, at £2 4s. 6d. a quarter.
26. Find the cost of 18 cwt. 1 qr. 18 lbs. at £8 12s. 4d. per ton.
27. Find the quantity of alloy in 714 oz. 10 dwts. 20 grs. of bullion, containing 10 oz. 17 dwts. 14 grs. of pure silver in the lb.
28. Find how much must be paid on a debt of £759 19s. 2d. at 13s. 7½d. in the pound.
29. How much income-tax must be paid on an income of £756 18s. 6d. at 1s. 2d. in the pound?
30. Standard gold being worth £3 17s. 10½d. per oz. Troy, what will be the price of 2 lbs. 9 oz. 6 dwts. 16 grs.?
31. Find the value at £3 6s. 5d. per oz. of 13 lbs. 9 oz. 3 dwts. of gold dust.
32. Required the price of 4 cwt. 2 qrs. 16 lbs. at £4 12s. 5½d. per cwt.
33. What is the expense of purchasing 8 tons 2 cwt. 3 qrs. 16 lbs. of iron, at £3 10s. 6d. per cwt.?
34. Required the cost of 1190 poles 2 yds. 2 ft. of fencing, at £1 6s. 6d. per pole.
35. How much will 83 miles 3 furs. 30 po. 2¼ yds. of telegraph wire amount to, at £15 14s. 6½d. per mile?
36. Find the amount of a labourer's wages in 5 yrs. 12 months 3 wks. at £2 5s. 6d. per month.

37. What is the cost of painting 49 square yds. 1 ft. 82 in. at £1 8s. 9½d. per square yard?

38. Required the value of 9 cubic yards 21 ft. 432 in. of timber, at £4 14s. 6d. per cubic yard.

39. How much will it cost to replace a cistern, if £1 11s. 6d. per cwt. be allowed for the lead of the old one, which weighs 6 cwt. 1 qr. 10 lbs., the new one weighing 8 cwt. 2 qrs. 14 lbs., and new lead being £2 0s. 6d. per cwt.?

40. If a lb. of silver costs £3 6s. what is the price of a salver which weighs 7 lbs. 7 oz. 10 dwts., subject to a duty of 1s. 6d. per oz. and an additional charge of 1s. 10d. per oz. for workmanship?

SIMPLE PROPORTION.

Ex. XLII.

1. Complete the following proportions :

$$(1.) \frac{2}{3} : \frac{3}{4} :: \frac{7}{8};$$

$$(2.) \frac{1}{2} : 2.5 :: 5\frac{1}{2};$$

$$(3.) .0004 : 1.4 :: .02;$$

$$(4.) 1.0004 : 1.4 :: .02.$$

2. Find a magnitude having the same ratio to 2.4167, that £7 10s. has to £8 17s. 6d.

3. Find a fourth proportional to £7 10s., $\frac{2}{3}$ of $\frac{3}{4}$ of £5, and .016.

4. How much gold dust can be purchased for £1073 9s. 6d. at £3 5s. per ounce?

5. If 7 cwt. 1 qr. 6 lbs. cost £7 7s. 5½d., what is the cost per cwt.?

6. If a labourer earn 1s. 9d. a-day, when wheat is at 7s. a bushel, what ought he to receive when wheat is at 9s. a bushel?

7. If the progress of sound be uniformly 1142 feet per second of time, in what time will the report of a piece of ordnance be heard at the distance of 13 miles?

8. If $\frac{1}{4}$ of an estate be worth £1003 17s. 1d., what is the value of $\frac{2}{3}$ of it?

9. How much in the pound is £603 15s. out of £840?

10. If 4½ oz. of tea cost 8½s., what will 30½ lbs. cost?

11. The gold in a sovereign is 22 carats fine; if instead it were 22½ carats fine, how much would the coin be worth?

12. What is the value in English money of 1556·85 francs, when the exchange is at 24·25 francs for £1 ?

13. A bankrupt's debts amount to £739 10s., and his assets to £640 9s.; how much in the pound can he pay ?

14. A bankrupt owes *A* £1250, *B* £3275, and other creditors £3525, and *A* finally receives £250; what is the value of the bankrupt's property, and how much is paid in the pound ?

15. A bankrupt owes three creditors *A*, *B*, and *C*, £10000, 10000 guineas, and 10000 shillings respectively; and he has property to the amount of £7000; find how much he will pay in the pound, and how much each creditor will receive.

16. A creditor receives on a debt of £296 a dividend of 12s. 4d. in the pound, and he receives a further dividend upon the deficiency of 3s. 9d. in the pound; what does the creditor receive in the whole ?

17. What is the income corresponding to an income-tax of £13 2s. 6d. at the rate of 7d. in the pound ?

18. A person after paying a poor-rate of 10d. in the pound, has £728 6s. 8d. remaining; what had he at first ?

19. A person pays 7d. in the pound for income-tax on his income, and then has £563 1s. 8d. remaining; what had he at first ?

20. A man has an income of £200 per annum; an income-tax is established of 7d. in the pound, while a duty of 1½d. per lb. is taken off sugar; what must be his yearly and daily consumption in order that he may just save his income-tax ?

21. If 13½ English ells of cloth cost 15½ guineas, how many yards of the same can be bought for £36 17s. 6½d. ?

22. If a penny loaf weigh 8 oz. when wheat is at 15s. a bushel, what must be the price of wheat when a twopenny loaf weighs 17 oz. ?

23. The proprietor of $\frac{1}{4}$ of a mine sold $\frac{1}{10}$ of his share for £7000; what should he who owns $\frac{2}{3}$ of the same mine get for $\frac{1}{5}$ of his share ?

24. A bankrupt's assets are £663 12s., out of which he pays 15s. in the pound on half his debts, and 12s. on the other half; find the amount of his debts.

25. If 1 lb. Avoirdupois be equal to 7000 grains Troy, and if 6144 sovereigns weigh 133 lbs. 4 oz. troy, how many sovereigns will weigh an Avoirdupois ounce ?

26. If 175 lbs. Troy are equivalent to 144 lbs. Avoirdupois, how much Troy weight is equivalent to 3 cwt. 3 qrs. 20 lbs. Avoirdupois ?

27. The large-grained powder of the English service weighing 55·5

lbs. per cubic foot ; find (1) the number of cubic inches which would be occupied by 1 oz. of this powder, and (2) the weight of 1152 cubic inches.

28. In the copper coinage 24 pence are made from an Avoirdupois pound of copper ; find the weight of a newly-coined penny (1) in drams Avoirdupois, and (2) in grains Troy, an ounce Avoirdupois containing 16 drams Avoirdupois or $437\frac{1}{2}$ grains Troy.

29. A person buys 3 cwt. 1 qr. of a certain article at £2 per cwt., and 5 cwt. 3 qrs. 8 lbs. at £2 10s. per cwt. ; at what price per cwt. may he sell the whole, so as neither to gain nor lose ?

30. A person purchases 2 cwt. $17\frac{1}{2}$ lbs. of a certain article at £5 per cwt. ; but in consequence of its being damaged, the price is afterwards reduced to 8d. per lb. ; how much money will be returned to him ?

31. If the lb. weight of standard silver (composed of 222 dwts. of pure silver and 18 of alloy) be coined into 74 shillings, and the lb. weight of standard gold (composed of 220 dwts. of pure gold and 20 of alloy) be coined into 44 sovereigns ; find the value of an ounce of pure silver, and how many ounces of pure silver are worth an ounce of gold.

32. A garrison of 360 men have provisions for 6 months ; but hearing of no relief at the end of 5 months, find how many men must depart that the provisions may last as much longer.

33. A man who works 10 hours a day does a piece of work in $4\frac{1}{2}$ days ; how many hours a day must he work to finish it in 4 days ?

34. A garrison of 1000 men, which was victualled for 60 days, was reinforced at the end of 18 days, and then the provisions were exhausted in 30 days ; required the number of men in the reinforcement.

35. A stationer bought 138 reams of paper at 10s. a ream, of which he retained 18 reams for his own use ; at what price per ream must he sell the remainder that he may have his own for nothing ?

36. If a grocer buy 7 cwt. 3 qrs. 14 lbs. of sugar for £9 10s. 6d., and retain 1 cwt. 1 qr. 5 lbs. for his own use, at what price per cwt. must he sell the remainder so as to get his own for nothing ?

37. A clock gains $3\frac{1}{2}$ minutes per day ; how should its hands be placed at noon that it may give the true time at half-past eleven at night ?

38. If 50 women or 33 men can reap a field of corn in 7 days, in what time can 40 men and 20 women together reap the same ?

39. If 14 men or 18 women or 24 boys can complete a piece of work in 29 days, in what time will 28 men and 9 women and 24 boys together do the same ?

40. If 1 lb. Avoirdupois be equivalent to 7000 grains Troy, and 1869 sovereigns weigh 40 lbs. Troy, how many sovereigns will weigh an Avoirdupois ounce ?

41. If a treasure of silver was worth £1800000 in the reign of Henry VII., when silver was £1 17s. 6d. per lb. Troy, what is it worth when silver is 5s. 6d. per oz. ?

42. An income-tax of 7d. in the pound is paid by 800,000 persons, and realizes the sum of £5,000,000 ; what is the average income of the tax-payers ?

If 2,000,000 more persons subscribed to the tax, whose average income is £100, by how much would the rate per pound be reduced, if the same sum as before be obtained ?

43. A watch which loses 2 minutes 5 seconds in a day, is set 9 minutes 20 seconds too fast on Monday at noon ; what time will it indicate on the succeeding Friday at midnight ?

44. If a train travel 171 miles in 5 hours when the stoppages amount to 3 minutes per hour, how far will it travel in 7 hours when 5 minutes per hour are lost by delays on the road ?

45. If an ounce Troy of standard gold, of which $\frac{1}{12}$ part is alloy, be worth £3 7s. 10½d., what is the value of 112 lbs. Avoirdupois of Australian gold containing only $\frac{3}{8}$ part alloy ?

46. A railway train started 10 minutes ago towards a station 10 miles distant, at the rate of 25 miles an hour, and will stop 1 minute at the station ; how many miles an hour must an express train now starting travel, so that it may get to the station just as the other train is leaving ?

47. *A* and *B* run a race of 605 yards, and they run at the rate of 11 miles and $8\frac{1}{2}$ miles an hour respectively ; what start can *A* allow *B*, so as just to win the race by 1 yard ?

48. *B* was $1\frac{1}{2}$ mile in advance of *A*, when *A* started in pursuit of him at the rate of 11 miles an hour, while *B* can only run $9\frac{1}{2}$ miles an hour ; how far can *B* run before he is caught ?

49. A person mixes 86 lbs. of coffee with 29 lbs. of chicory, the ratio of their values being as 1 : $\frac{1}{3}$; at what does he value the coffee and chicory respectively if he sells the mixture at 1s. 8d. per lb. ?

50. A grain of gold can be beaten into a leaf of 56 square inches ; how many of these leaves will make an inch in height, supposing a cubic foot of gold to weigh 10 cwt. 95 lbs. Avoirdupois ?

COMPOUND PROPORTION.

Ex. XLIII.

1. If 7 men earn £9 10s. 6d. in $10\frac{1}{2}$ days, what sum will 28 men earn in $31\frac{1}{2}$ days?
2. If 819 men will consume 351 quarters of wheat in 5 months, how many will consume 1464 quarters in 7 months?
3. If the carriage of 60 cwt. for 20 miles cost £14 10s., what weight can be carried 30 miles for £5 8s. 9d.?
4. If 20 men could perform a piece of work in 12 days, required the number of men who could accomplish another work three times as great in $\frac{1}{2}$ part of the time?
5. If 10 men can reap a field of corn of $7\frac{1}{2}$ acres in 3 days of 12 hours each, how long will it take 8 men to reap 9 acres, working 16 hours a-day?
6. If 3 men working 11 hours a-day can mow 20 acres in 11 days, how many men working 12 hours a-day will mow a field 384 yards long and 300 yards broad in 4 days?
7. If 1500 copies of a book of 11 sheets require 66 reams of paper, how much paper will be required for 5000 copies of a book of 25 sheets of the same size as the former?
8. The wages of 10 men for 5 weeks being £27 10s., how many weeks will 3 men work for £33?
9. If 858 men in 6 months consume 234 quarters of wheat, how many quarters will be required for the consumption of 979 men for three months and a half?
10. If it cost £59 2s. $1\frac{1}{2}$ d. to keep 3 horses for 7 months, what will it cost to keep 2 horses for 11 months?
11. The carriage of 4 cwt. 3 qrs. for 160 miles costs £3 17s.; what will the carriage of 11 cwt. 3 qrs. 14 lbs. cost for 100 miles?
12. If 25 men do a piece of work in 24 days working 8 hours a day, in how many days would 30 men do the same piece of work working 10 hours a day?
13. If 25 labourers can dig a ditch 220 yards long, 3 ft. 4 in. wide, and 2 ft. 6 in. deep, in 32 days, when the day is 9 hours long, how many labourers would be able to dig a ditch half a mile long, 2 ft. 4 in. deep, and 3 ft. 6 in. wide, in 36 days, when the day is 8 hours long?

14. If 120 men in 3 days of 12 hours each can raise an embankment 30 yards long, 2 feet broad, and 4 feet high, how many men will be required to raise an embankment 50 yards long, 6 feet high, and a yard and a half broad, in 9 days of 15 hours each?

15. If 3 men working 8 hours a day, can build a wall 8 yards long in 6 days, what time will 7 men take to build a wall 14 yards long, of the same thickness, but twice the height, supposing them in this case to work 10 hours a-day?

This answer to be given in days and hours.

16. A beam 32 feet long, $1\frac{1}{8}$ foot broad, and 1 foot thick, costs £4; what will be the cost of a beam 14 feet long, $2\frac{1}{4}$ feet broad, and 6 inches thick?

17. If the carriage of 15 tons 17 cwt. 1 qr. of goods for $257\frac{1}{4}$ miles cost £16 6s. $7\frac{1}{2}$ d., what weight at the same rate will be carried 211 $\frac{1}{2}$ miles for £21 15s. 6d.?

18. If 136 labourers can dig a trench 48 yards long, 1 ft. 3 in. broad, and 3 ft. 4 in. deep, in 5 days of 6 hours each, how many men would be required to dig a trench 90 yards long, 2 ft. 6 in. broad, and 3 ft. deep, in 27 days of 10 hours each?

19. If 9 workmen, working 8 hours a-day, take 24 days to dig a ditch 65 yards long, 13 broad, and 5 deep, in how many days will 72 workmen dig a ditch 327 yards in length, 18 in breadth, and 7 in depth, supposing they work 10 hours each day?

20. If the sixpenny loaf weigh 4·35 lbs. when wheat is at 5·75s. per bushel, what ought to be paid for 49·3 lbs. of bread when wheat is at 18·4s. per bushel?

21. A person is able to perform a journey of 142·2 miles in $4\frac{1}{2}$ days, when they are 10·164 hours long; how many days will he be in travelling 505·6 miles, when the days are 8·4 hours long?

22. If 30 cannon firing 4 rounds in 5 minutes kill 640 men in an hour, how many men would be killed in an hour and a-half, by 10 cannon firing at the rate of 3 rounds in 4 minutes?

23. If a brass gun weighing 9 cwt. 1 qr. 7 lbs. be worth £93 2s. 6d., when copper is at 1s. 6d. per lb.; what will be the weight of a gun that costs £137 10s., when copper is at £9 6s. 8d. per cwt.?

24. When copper is at £5 17s. 6d. per cwt., 175 cwt. 0 qrs. $24\frac{1}{2}$ lbs. of gun-metal can be purchased for £1045 15s.; what is the price of copper per cwt. when 44 cwt. 2 qrs. 14 lbs. of gun-metal can be purchased for £277 13s. 4d.?

25. If 3 men or 5 boys can do a certain piece of work in 7 days of 8 hours each, in how many days of 10 hours each can 3 men and 5 boys together do the same?

26. If 5 men and 7 boys can reap a field of corn of 125 acres in 15 days, in how many days will 10 men and 3 boys reap a field of corn of 75 acres, each boy's work being $\frac{1}{3}$ of a man's?

27. If 12 oxen and 35 sheep eat 12 tons 12 cwt. of hay in 8 days, how much will it cost per month of 28 days, to feed 9 oxen and 12 sheep, the price of hay being 4 guineas a ton, and 3 oxen being supposed to eat as much as 7 sheep?

28. If 5 horses require as much corn as 8 ponies, and 15 quarters last 12 ponies for 64 days, how long may 25 horses be kept for £41 5s. when corn is 22 shillings a quarter?

29. If 30 men in $5\frac{1}{2}$ days can plough 6 rectangular fields the sides of each of which are 40 and 66 yards, how long will 100 men and 50 boys be in ploughing 24 similar fields, the sides of which are 50 and 80 yards each, a boy's being assumed to be one-half a man's work?

30. If 7 oxen or 12 sheep can feed on a certain field for 6 days, how many days can 18 sheep and as many oxen feed on a field $3\frac{1}{2}$ times as large?

31. If 1 lb. of gold $\frac{11}{12}$ fineness cost £46 14s. 6d., what is the value of 7 dwts. 12 grs. at $\frac{916}{1000}$ fineness?

32. If 150 men dig a trench 230 yards long, 4 wide, and 10 deep, in 12 days, working 10 hours a day, in how long a time will 50 more men dig a trench half as long again, twice as wide, and the same depth, working 12 hours a day?

33. A wall that was to be raised 36 feet high was raised 9 feet in 6 days by 16 men; how many more men must be employed to finish it in 4 days?

34. 6750 tons weight of ammunition are to be removed from a fortress in 7 days; but it is found that in the first three days 36 horses have only removed 2250 tons; how many horses are required to carry away the rest in the time specified?

35. A bank of earth 330 yards long was to be raised by 40 men in 7 days; but at the end of 5 days only 220 yards were completed; find how many men should be added to finish the bank in the proposed time.

36. A person contracted to complete 500 yards of railway in 40 days, and hired 120 men for that purpose; but at the end of 25 days he finds

only 200 yards finished; how many more men must he employ to finish the work in the given time?

37. If 30 men in 84 days of 12 hours each build a wall 700 feet long, 12 feet high, and 2 feet thick, how many men in 72 days of 10 hours each can build a wall 8 feet high and 18 inches thick round a square of 225 feet each side?

38. If 248 men in 5 days of 11 hours each can dig a trench 230 yards long, 3 yards wide, and 2 yards deep, in how many days of 9 hours each will 24 men dig a trench 5 yards wide and 3 deep round a rectangular enclosure 70 yards long and 50 broad?

39. Four men working 8 hours a day take 22 days to pave a road 440 yards long and 35 feet broad; how many days will 4 men, two of whom work 8 hours and two 10 hours a day, take to pave a road 1575 yards long and 36 feet 6 inches broad?

40. If 4 compositors working 11 hours a day take 16 days to set up a work of 315 pages, of 40 lines in a page and 44 letters in a line, what time will 6 compositors, four of whom work 8 hours and two 10 hours a day, take to set up a work of 1575 pages of 45 lines in a page and 52 letters in a line?

PROPORTIONAL PARTS.

Ex. XLIV.

1. Divide £26 4s. 2d. into two parts which shall be to each other as 7 : 13.

2. Divide £714 10s. between *A*, *B*, and *C*, in the ratio of 7, 11, and 17.

3. Divide £156 13s. into parts, in the ratio to each other of 6, 9, and 11.

4. Four persons, *A*, *B*, *C*, and *D*, rent a pasture for £50; *A* puts in 7 cattle, *B* 8, *C* 9, and *D* 10; how much should each person pay for his share?

5. A house and garden cost £850, and the price of the house was to that of the garden as 11 : 5; find the price of each.

6. Three persons agree to subscribe for the purchase of a ship in proportion to the numbers 2, 3, and 4; supposing the vessel cost £48000, what was each man's share of the expense?

7. The gold coinage of Great Britain consists of an alloy composed

of 11 parts of gold and 1 of copper; how much of each is there in a sovereign, the weight of which is 5 dwts. 2½ grs.?

8. A contribution of £700 was imposed on four villages, to be paid in proportion to the number of their inhabitants; the first contained 250 persons, the second 350, the third 400, and the fourth 500; find what each village had to pay.

9. Standard silver consists of a mixture of which 18 parts are pure silver and 4 are alloy; find how much pure silver and how much alloy are contained in a mass weighing 366 lbs. 14 oz. 10 dwts.

10. A piece of land of 200 acres is to be divided among 4 persons in proportion to their rental from surrounding property; supposing these rents to be £500, £350, £800, and £90, how many acres must be allotted to each?

11. A metal is composed of 11 parts gold and 1 copper, another of 5 parts gold and 8 silver, and a third of 12 parts silver and 1 copper. These are mixed together in the ratio of 8, 9, and 10, and the compound weighs 1 cwt.; how much gold, silver, and copper respectively are contained in the mixture?

12. Gunpowder being composed of nitre 15 parts, charcoal 3 parts, and sulphur 2 parts, find how much of each is required in making 16 cwt. of powder.

13. Two engines 50 miles apart are approaching each other at the rates of 35 and 45 miles an hour; how long will it be before they meet?

14. A legacy of £1000 is left to three individuals in the proportion of 1, 2, and 3; find the sum received by each after deducting the legacy duty of 10 per cent.

15. From two stations 112 miles apart, two trains start at 2 hrs. 15 min. P.M. towards each other, one at 25 miles an hour, the other at 32 miles an hour; at what time will they meet?

16. The capital of a firm consists of £713 3s., £964 17s., and £2391 3s., subscribed by three partners; divide £2231 among them in proportion to their several capitals.

17. A and B agree to divide their travelling expenses in the proportion of the numbers 5 and 7; A pays on the whole £25 16s., and B pays on the whole £15 17s.; what has the one to pay and the other to receive in order to settle the account?

18. A mixed metal consists of 87 parts pure silver and 13 parts copper; what is the value of 29 lbs. 2 oz. Troy of this mixture, when

pure silver is at 5s. 6d. per oz. Troy, and copper at 1s. per lb. Avoir-dupois ?

19. *A*, *B*, and *C* subscribe £110 10s., £210, and 300 guineas respectively towards a certain transaction, which produced them a clear profit of £120 ; what is each man's share of this profit ?

20. Three pumps draw water from a certain well in quantities as $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$; find how much water has been discharged, when the first pump has drawn 10000 gallons more than the second.

21. *A* and *B* are partners in a business to which they have contributed £1200 and £2000 respectively ; *A* is to have 10 per cent. of the profits for managing the business, and the remaining profits are to be shared in proportion to the capital contributed by each ; the first year's profits are £800 ; how much should each receive ?

22. If in gun-metal the proportion of tin to copper is as 7·75 to 92·25, what is the value of 6 guns, each weighing 7 cwt. 2 qrs. 14 lbs., when tin is at £80 10s. per ton, and copper at £80 15s. per ton ?

23. Divide 600 guineas into three parts in the ratio of 3 : $5\frac{1}{2}$ and 5 : $7\frac{1}{2}$.

24. *A* is to *B* as $\frac{1}{2}$: 3, and *B* is to *C* as 3 : $2\frac{1}{2}$; their sum is 183 cwt. 1 qr. $2\frac{1}{2}$ lbs. ; find *A*, *B*, and *C*.

25. Two liquids are delivered by two pipes into a vessel ; their velocities are as 4 : 5 ; the magnitude of the pipes as 2 : 3 ; their specific gravities as 15 : 4 ; and the time during which they flow as 7 : 18 ; supposing that one ton of liquid is received into the vessel, find what weight of each liquid the vessel contains.

26. Two lots of cloth which together amount to 204 yards, are in length as 8 to 9, and in price as 10 to 11, and the total value is £134 5s. ; required the separate quantities and prices per yard.

INVERSE PROPORTION.

Ex. XLV.

1. *A* can reap a field in 30 days, and *B* in 20 days ; in what time can they reap it together ?

2. *A* can perform a piece of work in 4 days, which *B* can perform in 5 ; in what time can they complete it together ?

3. If one cock will empty a cistern in 15 minutes, and another fill it in 8 minutes, and both be opened together when the cistern is empty, in how many minutes will it be filled ?

4. A canal is filled by one sluice in 12 days, and by another in 4 days ; in what time will it be filled by both together ?

5. *A*, *B*, and *C* together have done a piece of work in 3 days ; *B* alone has done it in $6\frac{1}{2}$ days, and *C* alone in $8\frac{1}{2}$ days ; in what time may *A* alone undertake to do it ?

6. It being given that *A* and *B* can do a piece of work in $2\frac{8}{11}$ days ; that *A* and *C* can do the same in $2\frac{1}{2}$ days, and that *B* and *C* can do it in $3\frac{3}{5}$ days ; find the time in which *A*, *B*, and *C* would do the work, working first all together, and secondly separately.

7. *A* and *B* can do a piece of work in 10 days, *A* and *C* in 12 days, *B* and *C* in 15 days ; in what time can they do it jointly and separately ?

8. *A* can do a piece of work in $7\frac{1}{2}$ days, *B* can do the same in $6\frac{1}{2}$ days, and the two together, with the assistance of *C*, can do it in $2\frac{1}{2}$ days ; in what time can *A* and *B* do it without *C*'s assistance, and in what time can *C* alone do it ?

9. A cistern has four cocks, two of which are designed to fill it and two to empty it. If it be empty, No. 1 alone will fill it in 6 hours, or No. 2 alone in 5 hours ; when full, No. 3 alone will empty it in 4 hours, and No. 4 in 8 hours. Supposing the cistern to be full, in what time will it be emptied if all the cocks are set open at the same time ?

10. *A*, *B*, and *C* do a piece of work in 12 hours, *A* and *B* do the same in 16 hours, and *A* and *C* in 18 hours ; in what time will each do it separately, and how long will *B* and *C* take to do it ?

11. *A* can do with *B*'s assistance a piece of work in 5 days, which he can do with *C*'s assistance in 6, and which *B* and *C* together can do in 7 days ; find how long *A* would take to do it with the assistance of both *B* and *C*, and also how long he would take to do it alone.

12. *A* and *B* together can reap a field in 12 days ; *B* and *C* together in 13 days ; but if a boy *D* helps, then they will finish the work as soon as *A* and *B* can ; what time would *D* alone take ?

13. Three agents, *A*, *B*, and *C* can produce a given effect in 5 days ; *A* and *B* can produce it in 6 days, and *A* and *C* in $7\frac{1}{2}$ days ; in what time can *B* and *C* produce it ?

14. *A* and *B* can plough a field in 3 days, *A* and *C* in $2\frac{1}{2}$ days, and *B* and *C* in 2 days ; how long will *A*, *B*, and *C*, together take to plough a field half as large again ?

15. If *A* can by himself perform a certain quantity of work in 5 days, *B* twice as much in 7, and *C* 4 times as much in 11 days ; in what time can *A*, *B*, and *C* together perform 3 times the original quantity ?

16. A vessel may be filled from a certain pipe in 5 hours, from another in 6 hours, and from another in 12 hours ; how long will it take to fill the vessel when the last pipe runs for one hour, and the others till the vessel is filled ?

17. A can do a piece of work in $6\frac{1}{2}$ days, B in $5\frac{1}{2}$ days, and C in $4\frac{1}{2}$ days ; in what time would they together finish a work $3\frac{1}{2}$ times as great, supposing them to work 8 hours a-day instead of 10 ?

18. A can dig a certain trench in 5 hours, B in 9 hours, and C in 15 hours ; how long would A and B take to dig the trench, C working for 1 hour ?

19. Two pipes supply water to a cistern, one of which would fill it in 3 hours and the other in 4 hours 20 minutes ; and there is a third pipe which would empty the cistern in $5\frac{1}{2}$ hours ; supposing them all to be open, in what time will the cistern be filled ?

Also, supposing that at the end of $\frac{3}{4}$ of an hour the third pipe is closed, in what time from the commencement will the cistern be filled ?

20. If A can do as much work in 5 hours as B can do in 6 hours, or as C can do in 9 hours ; how long will it take C to complete a piece of work, one-half of which has been done by A working 12 hours and B working 24 hours ?

THE CHAIN RULE.

Ex. XLVI.

1. If 14 of A count for 15 of B , and 18 of B for 21 of C , and 24 of C for 25 of D , and 30 of D for 32 of E ; how many of E count for 108 of A ?

2. If 13 cubic feet will hold 81 gallons, and 16 pints are equal to 15 sextarii, and 7 sextarii are equal to 6 chœnices ; how many chœnices are there in 910 feet ?

3. If 12 oxen are worth 29 sheep, 15 sheep worth 25 hogs, 17 hogs worth 3 loads of wheat, and 8 loads of wheat worth 13 loads of barley ; how many oxen must be given for 1885 loads of barley ?

4. If $19\frac{1}{2}$ ounces of platina are worth 23 of gold, and 21 ounces of gold are worth 38 of silver, and 9 ounces of silver are worth 11 of copper, and 23 ounces of copper are worth 27 of iron ; how many ounces of iron are worth 819 ounces of platina ?

5. If Jupiter's first satellite performs 15 revolutions while the

second performs 7, and the second revolves 31 times while the third revolves 16 times, and the third revolves 40 times while the fourth revolves 17 times; how many revolutions will the first perform while the last makes 476 revolutions?

6. What sum in English money must be given for 500 francs when 25·6 francs are exchanged for £1? What is the rate of exchange between London and Paris when 3 francs = 480 rees, 400 rees = $3\frac{1}{2}$ shillings Flemish, and 35 shillings Flemish = £1?

7. If 2 horses on a tram-road can move as much as 5 horses on a common road, and 20 men can move as much as 3 horses on a tram-road; how many men can move as much as 30 horses on a common road?

8. In Austria 120 gulden (paper currency) are worth 100 silver gulden; what amount of paper money should be obtained for £10 sterling, if the value of £1 be 9 gulden 30 kreutzers in silver (60 kreutzers = 1 gulden)?

9. The rates of exchange being as follows:

£1 English	=	25·4 French francs,
3·75 francs	=	105 kreutzers,
60 kreutzers	=	1 florin,

and the price of posting in Germany being $1\frac{1}{2}$ florins per German mile, which = $4\frac{1}{2}$ English miles; find the cost in English money of posting 381 English miles in Germany.

10. A person in London owes another in St. Petersburg a debt of 460 rubles, which must be remitted through Paris. He pays the requisite sum to his broker at a time when the exchange between London and Paris is 23 francs for £1, and between Paris and St. Petersburg 2 francs for one ruble. The remittance is delayed until the rates of exchange are 24 francs for £1, and 3 francs for 2 rubles; what does the broker gain or lose by the transaction?

INTEREST.

Ex. XLVII.—CASE I.

1. Find the interest of £427 10s. 6d. at $3\frac{1}{2}$ per cent. for $2\frac{3}{4}$ years at simple interest.

2. What is the simple interest of £267 16s. for $3\frac{1}{2}$ years, at $4\frac{1}{2}$ per cent.?

3. What is the simple interest of £98 15s. 10d. for $\frac{1}{2}$ a year at $2\frac{1}{2}$ per cent.?
4. Find the simple interest of £237 5s. 6d. for $3\frac{1}{2}$ years at $4\frac{1}{2}$ per cent.?
5. What is the amount of £375 at $3\frac{1}{4}$ per cent. simple interest for $2\frac{1}{2}$ years?
6. Find the amount of £2736 10s. 6d. at simple interest, for 8 years at $3\frac{1}{2}$ per cent.
7. The sum of £192 15s. 7d. is put out at simple interest for $3\frac{1}{2}$ per cent.; what will it accumulate to in 7 years?
8. What is the difference between the simple interest of £50 19s. for 7 years at 3 per cent., and for 8 years at $2\frac{1}{2}$ per cent.?
9. A person has £1750 stock in the $3\frac{1}{4}$ per cents.; what will be his annual loss, if the interest be reduced to 3 per cent.?
10. What will £569 5s. 5d. amount to in $4\frac{1}{2}$ years, at $3\frac{1}{2}$ per cent. simple interest?
11. Find the amount of £781 5s. in two years, at 4 per cent. compound interest.
12. What is the amount of £666 13s. 4d. in 4 years, at 5 per cent. compound interest?
13. Find the interest on £10000 for 4 years at 3 per cent. compound interest.
14. A and B each lend £256 for 3 years at $4\frac{1}{2}$ per cent., one at simple interest, the other at compound interest; find the difference of the amount of interest they respectively receive.
15. Find the difference between the simple and compound interest of £248 for 3 years at $3\frac{1}{2}$ per cent.
16. Required the amount of £370 10s. in 3 years, at $4\frac{1}{2}$ per cent. compound interest.

EX. XLVIII.—CASE II.

1. Find the simple interest of £137 10s. at $3\frac{1}{4}$ per cent. for 219 days.
2. Find the simple interest of £1825 at 4 per cent. for 5 days.
3. Required the amount of £43800 for 13 days at 5 per cent. simple interest.
4. Required the simple interest of £788 2s. 6d. for 3 years and 62 days, at 4 per cent.

5. What is the interest of £913 1s. 8d. from May 1st to October 21st in the same year, at $5\frac{1}{4}$ per cent.?

6. Find the interest of £2250 10s. 6d. for 4 years and 5 months at $3\frac{1}{2}$ per cent. simple interest.

7. What is the simple interest of £200 for 125 days at $4\frac{3}{8}$ per cent.?

8. Find the simple interest of £675 3s. 4d. at $4\frac{1}{4}$ per cent. for 9 years and 215 days.

9. What is the amount of £852 6s. 8d. in 6 years and 245 days, at $5\frac{1}{4}$ per cent. simple interest?

10. What is the amount of £17 5s. for 70 days at 4 per cent. simple interest?

11. Required the simple interest on £945 3s. 4d. at $4\frac{1}{2}$ per cent. from June 20th, 1855, to April 25th, 1856.

12. If £2075 were put out to interest at $6\frac{3}{8}$ per cent. on May 10th, 1854, what would it have amounted to by March 25th, 1855?

EX. XLIX.—CASE III.

1. In what time will £365 amount to £424 6s. 3d. at $3\frac{1}{4}$ per cent. simple interest?

2. In what time will £142 10s. amount to £227 5s. 9d. at $3\frac{1}{2}$ per cent. simple interest?

3. In what number of years will £456 10s. double itself at $7\frac{1}{2}$ per cent. simple interest?

4. At what rate per cent. will £157 15s. 4d. amount to £295 16s. 3d. in 25 years, simple interest?

5. The simple interest of £40 for $4\frac{1}{2}$ years is 6 guineas; deduce the rate per cent.

6. At what rate per cent. simple interest will the interest of £375 amount to £63 5s. $7\frac{1}{2}$ d. in $4\frac{1}{2}$ years?

7. Find what sum of money will amount to £3502 15s. $0\frac{1}{2}\frac{3}{4}$ d. in 7 years at 4 per cent. simple interest.

8. What principal will amount to £455 13s. in $7\frac{1}{2}$ years, at 4 per cent. simple interest?

9. What sum will produce for interest £56 14s. in $2\frac{1}{4}$ years, at $4\frac{1}{2}$ per cent. simple interest?

10. In what time will £721 10s. amount to £841 10s. at $3\frac{1}{2}$ per cent.?

11. If £250 amount to £278 8s. 9d. in $3\frac{1}{2}$ years, what is the rate per cent. simple interest?

12. What principal put to interest for $5\frac{1}{2}$ years, at $2\frac{1}{2}$ per cent. simple interest, will amount to £1000?

13. Find the rate per cent., simple interest, when £450 amounts to £509 1s. 3d. in $3\frac{1}{2}$ years.

14. In what time will £1000 treble itself at $4\frac{1}{8}$ per cent. simple interest?

15. In how many years would £1 become £100 at 5 per cent. simple interest?

16. The sum of £2050 was lent to a certain Company at simple interest; find how much interest was due at the end of 3 years, supposing the rate of interest for the first year was $4\frac{1}{2}$ per cent., for the second 4 per cent., and for the third $3\frac{1}{2}$ per cent. Find also the uniform rate per cent. at which £2050 would produce in 3 years the same amount of interest.

17. What principal in 15 years at 4 per cent. simple interest, will amount to the same sum as £4500 in 9 years at 6 per cent.?

18. A person owes £4000, bearing interest at 5 per cent. per annum, and he pays at the end of each year for interest, and in part payment of the principal, £500; find the amount of his debt at the end of the third year.

19. A certain sum of money lent at simple interest amounts to £1071 in 6 months, and in 16 months its amount would be £1106; find the sum lent, and the rate per cent. of the interest.

20. A banker borrows money at $3\frac{1}{2}$ per cent. simple interest, and lends it out again at the rate of 5 per cent., and by this means gains £200 a-year; how much does he borrow?

21. Which is the greater rate of interest, £7 for the use of £145 for a year, or £4 10s. for the use of £91 5s. for a year?

22. When $4\frac{1}{2}$ per cent. simple interest is allowed for money, find the ratio of amount to capital at the end of $3\frac{1}{4}$ years.

Find also what principal would amount to £7246 10s. at that rate and time.

23. Find the amount accumulated at the end of 3 years by a person who invests £200 now, and does the same at the beginning of each succeeding year, at $3\frac{1}{4}$ per cent. compound interest on the whole sum invested.

24. A person on coming into an annuity of £1000, determines to

save every year one-fifth of his income and invest it; what will be his income in the fourth year after the annuity commences, supposing him to be able to obtain 5 per cent. for the money which he invests?

DISCOUNT.

EX. L.

1. Find the present worth of £132 3s. due $2\frac{1}{2}$ years hence, at $4\frac{1}{2}$ per cent. simple interest.
2. Find the discount and present worth of £1200 19s. 10d. due 10 months hence, interest being reckoned at 4 per cent.
3. What is the discount on £579 7s. 6d. due 8 months hence, interest being reckoned at $4\frac{1}{2}$ per cent.?
4. Find the discount on £813 9s. due $1\frac{1}{2}$ year hence, at $4\frac{3}{4}$ per cent.?
5. Required the present value of £252 19s. 3d. due a year hence, at $3\frac{1}{4}$ per cent.
6. If a bill of £676 13s. 4d. is due in 6 months, find what would be the payment in ready money, money being worth 3 per cent.
7. What is the present value of £150 due 9 months hence (£100 to be received immediately being considered of equal value with £105 to be received at the end of 12 months)?
8. Find the discount on £83539 7s. 6d. due 30 days hence, at 4 per cent. By how much does the interest of that sum for 30 days exceed the discount
9. What is the discount on £4068209, due $\frac{1}{8}$ th of a year hence, at $4\frac{1}{4}$ per cent simple interest?
10. Find the present worth of £60, payable after 6 years, at 5 per cent. simple interest.
11. A bill of £3050 is due 4 months hence; what sum will be deducted if it be paid immediately, interest being calculated at the rate of 5 per cent.?
12. Find the discount on £1639, for $\frac{3}{4}$ of a year, at $3\frac{1}{4}$ per cent. simple interest.
13. Required the discount of £100 for one year, at 5 per cent. simple interest; and the interest on this discount for the same time.
14. What is the discount on a bill of £120 16s. 8d., due 10 months hence, at $4\frac{1}{2}$ per cent.?

15. What sum of money must be paid down in order to receive £360 10s. two years hence, allowing $3\frac{1}{2}$ per cent. simple interest?

16. A bill of £1510 is paid $3\frac{1}{2}$ years before it becomes due; find the discount at 5 per cent. simple interest.

17. Find the discount on £85 10s. for half a year, at 5 per cent. simple interest.

18. What discount would be allowed on £746 17s. 8d. due $2\frac{1}{2}$ months hence, when the interest of money is $4\frac{1}{2}$ per cent.?

19. A bill of £120, due 4 years hence, was discounted for £20; required the rate per cent.

20. If the discount on £678 8s., which is due at the end of a year and a half, be £38 8s., what is the rate per cent. at simple interest?

21. A tradesman marks his goods with two prices, one for ready money, and the other for 1 year's credit, allowing discount at 5 per cent.; if the credit price be £2 9s., what ought to be the cash price?

22. A tradesman marks his goods with two prices, one for ready money, and the other for credit of 6 months; what ratio ought the prices to bear to each other, allowing 5 per cent. simple interest?

STOCKS.

Ex. LI.

1. What income will £395 12s. 6d. produce, when invested in the 3 per cent. Consols, at £90?

2. What sum must be paid for £439 12s. 5d., $3\frac{1}{2}$ per cent. stock, at $92\frac{1}{2}$ per cent.

3. Find the simple interest for $7\frac{1}{2}$ years on £4520 invested in the 3 per cents. when they are at $82\frac{3}{4}$ per cent.

4. Bought £650, 3 per cent. Consols, at $90\frac{3}{4}$ per cent., and paid brokerage $\frac{1}{2}$ per cent.; what did the whole amount to?

5. If £3714 19s. be laid out in purchasing 3 per cent. stock, at $95\frac{1}{2}$, what annual income will be derived from this investment? Would it be more or less advantageous to invest in the $3\frac{1}{2}$ per cents. at $97\frac{1}{4}$?

6. A person invests £20000 in the 3 per cents. at 80; what is his annual income, subject to an income-tax of 1s. 2d. in the pound?

7. A person invests £4620 in the 3 per cent. consols, at 92; what amount of stock does he receive, the brokerage being 2s. 6d. in the pound?

Also what amount does he receive annually from his investment, after deducting an income-tax of 7*d.* in the pound?

8. When the 3 per cent. Consols are at 95, what amount of stock can be purchased for £3400, the brokerage being 2*s.* 6*d.* per cent.?

Also what income would be realised by the investment, after deducting an income-tax of 7*d.* in the pound?

9. If a person invests his capital in the $3\frac{1}{2}$ per cents. at 94, at what rate per cent. does he receive interest on his capital? and what income will he have if he invests £1250?

10. If a person receives $4\frac{1}{2}$ per cent. interest on his capital by investing in the $3\frac{1}{2}$ per cents., what is the price of the stock? and how much stock can be purchased for £1200?

11. A person invested money in the 3 per cent. Consols when they were at 90, and some more when they were at 80; find the rate of interest he obtained in each case, and the advantage per cent. of the second purchase over the first.

12. Which investment will give the largest annual income—£1000 in £20 shares, when they are at £14 $\frac{1}{2}$ and pay 5 per cent., or £1000 in shares of £10 guaranteed 6 per cent.?

13. What sum must be invested in the 3 per cent. Consols, at 94 $\frac{1}{2}$, to yield an annual income of £500?

14. If £7927 10*s.* be laid out in purchasing 3 per cent. stock at 94 $\frac{3}{8}$, what income will be derived from this investment after deducting an income-tax of 7*d.* in the pound?

15. Which investment will yield the better interest, 3 per cent. at 90 $\frac{1}{8}$, or 4 per cent. at 120 $\frac{1}{8}$?

16. A person purchases £1000, 3 per cent. Consols, at 96 $\frac{7}{8}$, and sells out again when they have sunk to 82 $\frac{3}{4}$; how much does he lose by the transaction?

17. How much stock can be purchased by the transfer of £1000 stock from the 3 per cents. at 72 to the 4 per cents. at 90? and what difference in annual income will be produced by it?

18. A person purchases £1000, 3 per cent. Consols, at 83 $\frac{1}{2}$, and sells out again at 97 $\frac{1}{8}$; how much does he gain by the transaction?

19. If £1000 be laid out in the purchase of 3 per cent. Consols, which are at 81 $\frac{5}{8}$, at what price must the stock be sold to produce a gain of £100?

20. If I sell out of the 3 per cent. Consols at 98 $\frac{3}{4}$, and buy shares in

a canal yielding 3.02 per cent., do I gain or lose? and how much on every £100 I sell out?

21. A person invests £962 10s. in the 3 per cents. at 77, and when the funds have fallen 1 per cent. he transfers his capital to the 4 per cents. at 95; find the alteration in his income.

22. How much ought the 3 per cent. Consols to sink below par, in order that a broker may be enabled to obtain 4 per cent. on money?

23. A person invests £1000 in the 3 per cent. Consols, at $90\frac{1}{2}$; but the price rising to $91\frac{1}{4}$, he transfers his money to the $3\frac{1}{2}$ per cents. at $97\frac{1}{8}$; what will be the increase in his income?

24. A gentleman selling a mortgage of £800, for which he received $4\frac{1}{2}$ per cent. interest, bought £20 guaranteed 5 per cent. shares in the East Indian Railway, when they were at $2\frac{1}{2}$ premium; what was the alteration in his income?

25. A person desires to exchange 25 Spanish £100 bonds, and £800 $3\frac{1}{2}$ per cent. stock, for 3 per cent. Consols; the prices of these securities being 48, 99, and $93\frac{3}{8}$ respectively, what quantity of Consols can he obtain?

26. A person invests £1037 10s. in the 3 per cents. at 83, and when the funds have risen 1 per cent. he transfers his capital to the 4 per cents. at 96; find the alteration in his income.

27. A person has £2950 in the Danish 3 per cents. at $75\frac{1}{4}$, which he transfers to the Russian 5 per cents. at $110\frac{5}{8}$; required the alteration in his income.

28. A person invests £4800 in the 4 per cents. at 80, and at the end of each year invests the dividend which becomes due in the same stock; supposing the funds to remain at 80 for 3 years, find his dividend at the end of the third year.

29. What sum will be saved annually on a national debt of £4,000,000, if the interest be reduced from $3\frac{1}{2}$ to 3 per cent.; and if the price of the stock fell in consequence from 101 to $95\frac{3}{8}$, by how much would the fundholder's property be diminished?

30. If the 3 per cents. are at 95, and Government offers to receive tenders for a loan of £5,000,000, the lender to receive five millions in the 3 per cents. together with a certain sum in the $3\frac{1}{4}$ per cents.; what sum in the $3\frac{1}{4}$ per cents. ought the lender to accept?

PROFIT AND LOSS.

Ex. LII.

1. If a tradesman buys cloth at $13s. 4\frac{1}{2}d.$ per yard, and sells the same at $14s. 9d.$ per yard, what is his gain per cent.?
2. A grocer bought 14 lbs. of sugar for $6s. 3d.$ and resold it at $5\frac{1}{2}d.$ per lb.; how much per cent. did he gain?
3. If by selling tea at $\pounds 33$ 6s. per cwt. 10 per cent. is gained, what is the prime cost of $2\frac{1}{2}$ cwt.?
4. If when spirits are sold at $16d.$ a pint, $22\frac{1}{2}$ per cent. is gained, what is the prime cost of 100 gallons?
5. A tradesman buys cloth at $13s. 8d.$ per yard; at what price per yard must he sell it to gain $12\frac{1}{2}$ per cent.?
6. The selling price is marked on a book; but the publisher deducts $17\frac{1}{2}$ per cent. when selling them to the retail trader; how much per cent. is gained by retailing the books at this rate?
7. How much per cent. is gained by purchasing at $10\frac{1}{2}$ guineas per cwt. and selling at $2s. 3d.$ per lb.?
8. What is the salary of a clerk if, after deducting 5 per cent. for the superannuation fund, there remains an income of $\pounds 175$ 5s.?
9. An agent remitted to his employer $\pounds 998$ 15s. which was what he received diminished by $\frac{1}{8}$ per cent.; what was the sum he originally received?
10. A grocer buys 10 cwt. 3 qrs. 21 lbs. of sugar for $\pounds 30$, and pays $12s. 6d.$ for expenses; at what rate must he sell it per pound to clear 50 per cent.?
11. If 100 lbs. of tea be bought at $4s. 4d.$ and sold at $5s.$, and 100 lbs. of sugar bought at $6d.$ and sold at $7d.$, what profit per cent. will be realised on the whole outlay?
12. If 100 eggs be bought at three a penny, and 100 more at two a penny, what will be gained or lost per cent. by selling them all together at 5 for 6d.?
13. A bookseller is charged by the publisher $22\frac{1}{2}$ per cent. less than the selling price of the books he buys; if the bookseller lays out $\pounds 147$ 10s. with the publisher, how much will he realize by the sale of the books?
14. A pipe of wine costs $\pounds 98$, and contains 65 dozen and 4 bottles; what does it cost per bottle? How much would the price be increased by expenses amounting to 15 per cent. on the first cost?

15. A man sells a horse for £39 12s., and loses 12 per cent. on what the horse cost him ; what did he give for the horse ?

16. A person buys tea at 6s. a lb., and also some at 4s. a lb. ; in what proportions must he mix them, so that, selling his tea at 5s. 3d. a lb., he may gain 20 per cent. on each lb. sold ?

17. Bought 513 eggs at 7 for 3d., and as many more at 9 for 3d. ; if I retail them at 16 for 6d., how much do I lose, and how much per cent. ?

18. By selling oranges at 5 for 2d., half of which were bought at two a penny and the other half at three a penny, what is the gain or loss per cent. ?

19. A man mixes 20 gallons of ale, which has cost him 11d. per gallon, with 65 of beer which has cost him 5d. per gallon ; at what price must he sell the mixture in order to gain 20 per cent. on his outlay ?

20. A merchant sells 49 quarters of corn at a profit of 7 per cent., and 84 quarters at a profit of 11 per cent., and if he had sold the whole at a profit of 9 per cent. he would have received £2 10s. 9d. less than he actually did ; what was the price he paid for the corn ?

21. A grocer buys 567 cwt. of sugar at £1 19s. 10½d. per cwt., and mixes it with 1161 cwt. at £2 2s. 6½d. ; at what price per lb. must he sell the mixture in order to realize a profit of 12 per cent. ?

22. A merchant has bought a fifty-gallon cask of wine for £37 10s. ; supposing it to have lost 3½ gallons, what price per dozen should he ask for the remainder (9 bottles making 2 gallons) in order to gain 15 per cent. ?

23. A mixture of salt and water contains 25 per cent. of salt ; how many gallons of water must be added to 730 lbs. of this mixture that it may contain only 20 per cent. of salt, supposing that a gallon of water weighs 10 lbs. Avoirdupois ?

24. The gross receipts of a railway company in a certain year are apportioned as follows : 52 per cent. to give the shareholders a dividend at the rate of 6½ per cent. on their shares, 43 per cent. to pay the working expenses of the line, and the remainder £25,000 is reserved ; find the capital of the company.

25. A grocer buys 6 chests of tea (containing 84 lbs. each) at 3s. 4d. per lb., and sells one chest so as to gain 25 per cent. In consequence of a reduction in the duty he makes an abatement of 5½d., 7½d., 9½d., 11½d., and 1s. 1½d. per lb. in selling the five remaining chests respectively ; find how much he gains or loses by the transaction.

26. A person purchases 100 shares in a Company for £3500, and ultimately sells at a profit of 23 per cent., after having received four dividends of 27s. 4d., 17s. 4d., 33s. 10d., and 38s. 9d. a share; by how much do his receipts exceed his outlay?

27. A farmer rents a piece of land for £120 a-year, and lays out £625 in buying 50 bullocks. At the end of the year he sells them, having expended £12 10s. in labour; how much per head must he gain by them in order to realize his rent and expenses, and 10 per cent. upon his original outlay?

28. How much tea at 4s. 9d. per lb. must I give for 28 lbs. of sugar at 9½d., so as to gain 5 per cent. by the exchange?

29. A grocer buys a chest of tea containing 3 qrs. 5 lbs. at 3s. 2d. per lb., and two chests each containing 2 qrs. 15 lbs. at 3s. 4½d. per lb.; what will he gain per cent. by selling the mixture at 4s. per lb.?

30. A man buys 27 sheep for £30, and sells 12 of them at a loss of 3 per cent.; at what price per sheep must he sell the remainder that he may gain 2½ per cent. on the whole purchase?

AREAS AND VOLUMES.

Ex. LIII.

1. Multiply duodecimally 16 ft. 5 in. by 13 ft. 7 in.
2. Multiply duodecimally 23 ft. 10 in., 18 ft. 4 in., and 11 ft. 3 in.
3. Multiply 15 ft. 4½ in. by 9 ft. 7½ in. by duodecimals.
4. Find the product of 5 ft. 7½ in. by 6 ft. 8½ in. both duodecimally, and by taking aliquot parts of the multiplicand.
5. Multiply 17 ft. 2'. 3". lineal measure by 12 ft. 2'. 7". lineal measure, expressing the result in yards, feet, inches, and a fraction.
6. Multiply 27 ft. 2'. 7". square measure, by 9 ft. 7'. 6". lineal measure, and express the result in yards, feet, inches, and a fraction.
7. Find the volume of a cube whose edge is 13 ft. 8 in.
8. Find the square yards in a rectangular surface 111 ft. 6 in. by 17 ft. 9 in. both duodecimally and by taking aliquot parts.
9. A block of stone is 7 ft. 5 in. long, 4 ft. 7 in. broad, and 3 ft. thick; find duodecimally its solid contents in feet and inches.
10. Required the number of square feet and inches in the floor, and the number of cubic feet and inches in the volume of a room 21 ft. 5 in. long, 16 ft. 6 in. broad, and 10 ft. 8 in. high.

11. How many cubic feet of air are contained in a room 23 ft. 4 in. long, 13 ft. 3 in. broad, and 14 ft. 6 in. high ?

12. Find duodecimally the quantity of carpet required to cover a floor 9 yds. 2 ft. 6 in. in length, and 7 yds. 1 ft. 8 in. in breadth.

13. A certain row of houses stands upon an acre of ground ; the frontage is 300 yards ; what is the depth ?

14. A paling 572 yards long, at 6*d.* per square foot, costs £257 8*s.* ; how many feet high is it ?

15. Express 2 ft. $10\frac{1}{2}$ in. lineal measure, and 5 ft. $79\frac{1}{8}$ in. square measure, duodecimally, as feet, primes, &c. ; also, the latter quantity being the area of a rectangle, one of whose sides is the former, find its other side.

16. The area of an oblong room is 260 square feet, and the length of one side is 4 ft. 3 in. ; what is the length of the other side ?

17. A pit is 49 ft. 6 in. long, and 12 ft. 9 in. wide ; how many cubic feet of earth must be dug out in order to lower the surface 4 ft. 2 in. ?

18. What length must be cut off a board $6\frac{3}{4}$ inches wide, that the area cut off may be a square foot ?

19. The floor of a room is 9 yds. 6 ft. 11 in. in area, and its height 9 ft. 5 in. ; find its volume.

20. Find the number of square feet and inches in the floor, and the number of cubic feet and inches in the volume, and the number of square feet and inches in the surface of a room, 23 ft. 10 in. long, 18 ft. 4 in. broad, and 11 ft. 3 in. high.

21. What is the cost of paving a square court 23 yds. 7 in. a side, at one shilling a square foot ?

22. What will be the cost of painting a wall 23 ft. 6 in. by 10 ft. 4 in., at 5*s.* 6*d.* per square yard ?

23. Find the expense of carpeting a room 14 ft. 6 in. broad, by 18 ft. 9 in. long, at 4*s.* 2*d.* per square yard.

24. What must be paid for carpeting a room 14 ft. 6 in. long, and 10 ft. 4 in. broad, the charge being 10*s.* 6*d.* per square yard ?

25. Find the number of yards of paper $\frac{7}{8}$ ths of a yard wide, which will cover the walls of a room 18 ft. long, 12 ft. 9 in. wide, and 10 ft. 8 in. high.

26. Find the area of a floor 15 ft. 7 in. long, by 12 ft. 3 in. broad, by duodecimals ; and find the expense of carpeting it at 4*s.* 3*d.* per yard, the carpet being $\frac{3}{4}$ of a yard.

27. A room is 9 ft. 4 in. high, 12 ft. 6 in. broad, and 18 ft. 9 in. long ;

find the expense of hanging the walls with paper $\frac{3}{4}$ yd. wide, at $4\frac{1}{2}d.$ per yard, and of carpeting the floor at $5s. 6d.$ per square yard.

28. A room is 16 ft. 11 in. long, and 13 ft. 3 in. wide; find how many yards of carpet, 2 ft. 3 in. wide, will be required to cover it, and what will be its price at $4s. 7d.$ per yard?

29. How many yards of paper $\frac{3}{4}$ yard wide will be required for a room 9 ft. 7 in. high, 12 ft. 6 in. broad, and 18 ft. 9 in. long; and find the cost of papering it at $7\frac{1}{2}d.$ per yard.

30. Find the cost of paving a street $\frac{3}{4}$ of a mile long, and 53 feet broad, at the cost of $7\frac{1}{2}d.$ per square yard.

31. A cistern is 12 ft. 4 in. long, and 8 ft. 8 in. wide; find how many cubic feet of water must be drawn off in order that the surface of the water may fall 4 ft. 6 in.

32. A gardener has a piece of matting 73 yds. 1 ft. 8 in. long, and 3 ft. 9 in. broad, to cover a wall 94 ft. long and 10 ft. high; how many square feet of wall will be left uncovered?

33. On laying down a bowling-green with sods 2 ft. 6 in. long, by 9 in. wide, it is found that it requires 75 sods to form one strip extending the whole length of the green, and that a man can lay down one strip and a quarter each day; find the space laid down in 8 days.

34. The roller used for rolling a lawn being 6 ft. 6 in. in circumference, by 2 ft. 3 in. wide, is observed to make 12 revolutions as it rolls from one extremity of the lawn to the other; find the area rolled when the roller has passed 10 times the whole length of it.

35. A Turkey carpet, measuring 11 ft. 6 in. by 9 ft. 8 in., is laid down on the floor of a room measuring 14 ft. by 12 ft. 6 in.; determine the quantity of floor-cloth necessary to complete the covering of the area, and its price at $6s.$ per square yard.

36. If a postage-stamp be an inch long, and $\frac{1}{4}$ ths of an inch broad, how many stamps will be required for papering a room, 18 ft. 9 in. long, 16 ft. 10 in. broad, and 10 ft. 6 in. high?

37. A rectangular court is 125 ft. 9 in. long, and 25 ft. 10 in. broad; how many square yards does it contain? And how many square yards are in a footpath 5 ft. 6 in. wide, supposing the footpath to be made quite round the court on the outside of it?

38. How many paving stones, each of them 1 foot long, and $\frac{1}{4}$ ths of a foot wide, will be required for paving a street 45 feet wide, surrounding the outside of a square, the side of which is 225 feet?

39. A room is 20 ft. long, 15 ft. 6 in. broad, and 10 ft. 9 in. high; find

the expense of carpeting the floor at 6s. 8d. per square yard, and of hanging the walls with paper $\frac{3}{4}$ yard wide, at 2s. 6d. per yard.

40. A room 25 ft. 7 in. long, 18 ft. 11 in. broad, and 10 feet. 6 in. high, has two doors, each 7 ft. by 3 ft. 4 in., and 3 windows, each 6 ft. by 4 ft. 3 in.; determine the expense of plastering the walls and ceiling at 10½d. per square yard.

41. In a rectangular court, which measures 96 ft. by 84 ft., there are four rectangular grass plots, measuring each 22½ ft. by 18 ft.; find the cost of paving the remaining part of the court at 8d. per square yard.

42. How many yards of paper 1½ yard wide, will be required for a room 29 ft. 4 in. long, 18 ft. 7 in. broad, and 10 ft. 3 in. high, supposing the room to have one door 7 ft. 2 in. by 3 ft. 5 in., and 2 windows, each 6 ft. 6 in. by 3 ft. 7 in.; and find the expense of papering it at 1½d. per yard.

43. Determine the cost of raising the four walls of a house that is 27 ft. 6 in. high, 40 ft. 8 in. in front, and whose side walls are 36 ft. 9 in. in length, at 10s. 6d. a square of 100 feet; supposing the house to have two doors, each 7 ft. 6 in. by 4 ft. 7 in., and 24 windows, each 6 ft. 2 in. by 3 ft. 6 in.

44. Find how much sheet lead will be required to line a rectangular cistern 10 ft. 6 in. long, 6 ft. 4 in. wide, and 5 ft. 9 in. deep; and also find the cost of it at 1s. 8d. per square foot.

45. From a beam of timber 4 ft. 3 in. broad by 3 ft. 6 in. deep, a log is cut off containing 119 cubic feet; what would it cost to veneer the entire surface of this at 1s. 1½d. per square foot?

46. A chest is 4 ft. 8 in. long, 3 ft. 6 in. wide, and 2 ft. 9 in. deep; how many square feet of board does it contain? and what is the cost of painting the outside and inside of it at 1s. 6d. per square yard?

The bottom of the outside is not to be painted.

47. How many tiles, 11½ in. long by 7½ in. wide, will be required to pave an area 18 ft. 9 in. long by 15 ft. 8 in. wide? and what will be the expense of the tiles at ¾d. each, and the cost of laying them down at 9d. per square yard?

48. A plate of metal $\frac{1}{8}$ inch thick was burnished on one side for 11s. 6½d. at 2½d. per square inch; what is the weight of the plate, supposing a cubic foot of the metal to weigh 9000 oz. Avoirdupois; and what is the value of the plate at 11s. 1½d. per lb.?

49. A general, disposing his soldiers in a solid square, finds that he

has 284 men over and above; but on adding one more soldier to each side, he has 25 men too few; required the number in the army.

50. Water is rising in a cellar, whose area is 2000 feet, at the rate of 6 inches an hour, and is already a foot and a half deep. A pump which is able to carry off 1800 cubic feet of water in an hour is worked for 10 minutes at a time, with intervals of rest of 3 minutes; in what time will the whole be drawn off?

SQUARE ROOT.

Ex. LIV.

Find the square root of:

1. 128881.	16. 537·4.
2. 3895·0081.	17. 7·1836.
3. ·0172265625.	18. 9486769·6036.
4. 240398·012416.	19. 6414·247921.
5. 97·061904.	20. ·0001695204.
6. ·000080946009.	21. ·0172265625.
7. ·02.	22. ·00903687890625.
8. ·001.	23. ·94563.
9. 9605·9601.	24. ·0198.
10. ·0054804409.	25. 1·624.
11. 5·875.	26. $\frac{352}{881}$.
12. 1·075.	27. 3080 $\frac{1}{4}$.
13. 12088868379025.	28. 411 $\frac{388}{881}$.
14. ·007.	29. $\frac{13}{28}$.
15. ·031.	30. 5 $\frac{1}{3}$.

CUBE ROOT.

Ex. LV.

Find the cube root of:

1. 32768.	7. 669·921875.
2. 127263527.	8. 228099131.
3. 8365427.	9. 230346397.
4. ·001367631.	10. 69426531.
5. 27054·036008.	11. 134217728.
6. 231·475544.	12. 31·855013.

13. 12812904.	21. 520341 $\frac{1}{2}$.
14. 7256313856.	22. $\frac{722}{110808}$.
15. 10970645048.	23. $\frac{1}{8}$.
16. 001723683599.	24. $3\frac{1}{2}$.
17. 243087455521.	25. $\frac{5030912}{65536}$
18. 113028882875.	26. $\frac{1257728}{16384}$
19. 531244194299.	
20. $2\frac{1}{2}$ and $465\frac{1}{2}$.	

MISCELLANEOUS EXAMPLES IN EVOLUTION.

Ex. LVI.

- Find the square root of the sum of the squares of 2, 4, 6, and 86.
- Find the square root of $1\frac{1}{2}$ to five places of decimals, and thence deduce the square roots of 6 and $2\frac{3}{4}$.
- Find the square root of $1\frac{3}{4}$ to five decimal places, and thence derive the square roots of 15, and of $1\frac{7}{16}$.
- Extract the square root of 7, and thence derive the square roots of $\frac{1}{7}$, $1\frac{1}{2}$, and $\frac{3\frac{1}{2}}{4\frac{1}{2}}$.
- Extract the cube root of 233744896, and derive the cube root of this number multiplied by 008.
- Find the number of inches in the edge of a cube, whose solid content is 5359375 cubic feet.
- Determine the length of the side of a square, which is equal in area to the rectangle, the sides of which are 513 yds. 1 ft. 11 in. and 1628 yds. 11 in.
How much would it cost to cover the area with turf at $4\frac{1}{2}$ d. per square yard?
- Required the side of a square whose area is equal to that of a rectangle, the sides of which are 4714 yards and 210 yards.
- A cubical block of stone contains 50653 solid feet; what is the area of its side?
- Find the side of a square field containing 2 acres 121 yards.
- The solid content of a cubical room is 4913 cubic feet; what will be the cost of carpeting its floor at 4s. 6d. a square yard?
- Find the hypotenuse of a right-angled triangle of which the sides are 4 feet and 1 foot 8 inches.

13. If a marble block, 4 yards long, $2\frac{1}{2}$ broad, and $2\frac{1}{2}$ high, weighs 45 tons, what is the side of cubical block weighing 307 tons 4 cwt.?

14. Find a mean proportional between 1689 and 4096; also between .005 and .03125.

15. Extract the 6th root of 282429536481.

16. Find the diagonal of a cube whose solid contents are 12812.904 solid feet.

17. The lengths of the sides of a right-angled triangle are 1164 and 873 yards; find the length of the hypotenuse.

18. The side of a rectangle is 8076 yards, and the diagonal is 8749 yards; find the other side.

19. An oblong plantation containing an acre, ten times as long as it is broad, is cut through its length and breadth by roads 10 feet wide; what is the area occupied by trees?

20. If a rectangular room measures 29 ft. 6 in. long, 16 ft. 3 in. broad, and 12 ft. 4 in. high, what is the distance from one corner of the room to the middle of the ceiling?

21. Find the value of $\frac{3 - 5\sqrt{.0164}}{4\sqrt[3]{.0164} + \frac{1}{4}\sqrt[3]{216}}$, carrying the square and cube roots to 6 places of decimals, and the final division to 7 places.

ANSWERS TO THE EXAMPLES.

Ex. I. (p. 1.)

1. Ten thousand and ten millions, one hundred and one.
2. One thousand seven hundred and eighty-five millions, six hundred thousand and one.
3. Six hundred millions, two hundred and one.
4. Seven hundred millions, twenty thousand and twenty.
5. Thirty billions, nine hundred thousand and ten millions, one hundred and three thousand and four.
6. Two hundred billions, two thousand millions, two hundred thousand one hundred and one.
7. One thousand nine hundred and seventy-eight billions, six hundred thousand and fifty millions, ten thousand and one.
8. One hundred thousand two hundred billions, thirty thousand and forty millions, five hundred thousand six hundred.
9. Seven trillions, sixty thousand and fifty-two billions, one hundred thousand seven hundred and ten millions, four hundred and thirty-one thousand and eight.
10. Twenty-one trillions, three thousand billions, seven hundred and twelve thousand and three millions, forty-seven thousand eight hundred.
11. One trillion, fifty thousand three hundred and twenty billions, ninety-eight thousand one hundred and five millions, seven thousand and thirty-six.
12. Fifty trillions, forty thousand and seventy billions, thirty thousand six hundred and eighty-five millions, nine thousand one hundred and twenty.
13. Eight thousand five hundred and thirteen trillions, seventy-eight thousand four hundred billions, sixty-one thousand three hundred millions, one hundred and eighty thousand one hundred and ninety.
14. Sixty-four trillions, two hundred and one thousand eight hundred and ninety billions, five thousand and seventy millions, three thousand two hundred and eighteen.
15. Eight trillions, two hundred and fifty thousand seven hundred and forty-six billions, two hundred thousand and seventy-eight millions, five hundred and forty-three thousand and twelve.
16. Ninety thousand eight hundred and seven trillions, sixty thousand and fifty billions, forty thousand three hundred millions, twenty thousand one hundred.

Ex. II. (p. 1.)

- | | |
|-------------------------------------|------------------------------------|
| 1. 726. | 9. 4,000,000,004,000,000,040. |
| 2. 7,026. | 10. 20,000,000,000,200,000. |
| 3. 70,206. | 11. 106,080,040,902,050. |
| 4. 90,000,001,002,070. | 12. 7,000,032,005,012,010. |
| 5. 6,000,000,008,003,000. | 13. 13,000,006,400,011,005. |
| 6. 300,000,000,000,070,000,080. | 14. 25,018,000,000,065,040,017. |
| 7. 100,000,000,000,016,000,000,000. | 15. 100,800,002,087,019,030,021. |
| 8. 509,006,001. | 16. 2,056,014,070,500,302,900,613. |

Ex. III. (p. 2.)

- | | |
|-------------------------------|-------------------------------|
| 1. 257364926. | 14. 3743034 49 rem. |
| 2. 929138. | 15. 5000033994 . . . 505 . . |
| 3. 628806. | 16. 2148022189025005312773. |
| 4. 3527959344. | 17. 21027021. |
| 5. 2467760649255. | 18. 780032055 . . . 8530 rem. |
| 6. 34199859739125. | 19. 80304384. |
| 7. 15684752250. | 20. 306495278. |
| 8. 116581345962900. | 21. 5623009. |
| 9. 38180239122 . . . 33 rem. | 22. 67157148372. |
| 10. 187870 27 . . | 23. 32846. |
| 11. 716871. | 24. 554768. |
| 12. 374000052 . . . 3456 rem. | 25. 94760000 miles. |
| 13. 370527 938 . . | |

Ex. IV. (p. 3.)

- | | | |
|--------------------------------------|---|--------------------------------------|
| 1. 7944651. | 2. 3610360. | 3. 758075. |
| 4. 85829 sixpences, | 429145 threepenny pieces, | 3433160 threepenny farthings |
| pieces. | | 5. 155289. |
| 6. 50910½. | 7. 365112. | 8. 409002. |
| 9. 107310. | 10. 4680. | 11. 13 dys. 15 hrs. 27 mins. 5 secs. |
| 12. 8791 tons. 2 cwt. 3 qrs. 27 lbs. | 13. 9090. | |
| 14. 2 tons. 14 cwt. 2 qrs. | 15. 3 cub. yds., 108 sq. yds., 3888 lin. yds. | |
| 16. 58547145600 seconds. | | |

Ex. V. (p. 4.)

- | | |
|--|--|
| 1. £2929 18s. 3¼d. | 8. 1331 lbs. 2 oz. 18 dwts. 13 grs. |
| 2. £1008 13s. 7d. | 9. 229 lbs. 10 oz. 2 drs. 1 scr. 12 grs. |
| 3. £635 17s. 10d. | 10. 1080 yrs. 77 dys. 12 hrs. 6' 2". |
| 4. £3148 16s. 11d. | 11. 6088 acres, 3 ro. 30 po. |
| 5. 36 yds. 2 ft. 6 in. | 12. 856 qrs. 4 bus. 2 pks. 1 gal. |
| 6. 57 yds. 3 qrs. 2 nls. | 13. 3466 c. yds. 19 ft. 1289 in. |
| 7. 1348 tons, 2 cwt. 3 qrs. 17 lbs. | |
| 14. 1377 tons, 6 cwt. 0 qrs. 21 lbs. 1 oz. 14 drs. | |
| 15. 7 hrs. 34 mins. | |

Ex. VI. (p. 5.)

- | | |
|-----------------------|---------------------------------------|
| 1. £670 8s. 6d. | 16. £5741994 0s. 0½d. |
| 2. £360131 16s. | 17. £3365838 4s. 9d. |
| 3. £1895567 6s. 2½d. | 18. £4945574 12s. 9¼d. |
| 4. £1726670 19s. 7½d. | 19. £3686964 5s. 4¼d. |
| 5. £185649 7s. 8¼d. | 20. £9710368 19s. 2¾d. |
| 6. £650399 9s. 4½d. | 21. £1818252 5s. 0¾d. |
| 7. £2676638 8s. 6d. | 22. £5184475 14s. 4½d. |
| 8. £624950 12s. 5d. | 23. £1737892 8s. 1½d. |
| 9. £668222 0s. 1¼d. | 24. 23200 lbs. 1 oz. 14 dwts. 6 grs. |
| 10. £3241707 15s. 9d. | 25. 317135 lbs. 6 oz. 7 dwts. 12 grs. |
| 11. £4547262 5s. 1d. | 26. 133812 tons, 10 cwt. 2 qrs. |
| 12. £7301748 6s. | 27. 217 cwt. 0 qrs. 9 lbs. 9 oz. |
| 13. £6184925 4s. 5d. | 28. 58517 ms. 7 furs. 0 po. 4 yds. |
| 14. £5671750 5s. 5½d. | 29. 2022 wks. 2 dys. 13 hrs. 6 mins. |
| 15. £4797085 4s. 4½d. | 30. 2898 acres, 3 ro. 7½ po. |

Ex. VII. (p. 6.)

- | | |
|---|-------------------------------------|
| 1. £55 13s. 1d. | 18. £70 2s. 11¼d. ... 297 rem. |
| 2. £51 19s. 1¾d. | 19. £910 8s. 9d. ... 435 .. |
| 3. £1056 7s. 11d. ... 6 rem. | 20. £989 4s. 2½d. ... 343 .. |
| 4. £24 13s. 6½d. ... 82 .. | 21. £208 8s. 11¾d. ... 9389 .. |
| 5. £36 4s. 10½d. ... 255 .. | 22. £48 10s. 5½d. ... 1880 .. |
| 6. £368 16s. 7¾d. ... 11 .. | 23. £874 8s. 11¾d. ... 3908 .. |
| 7. £1053 6s. 8¼d. | 24. £174 8s. 9½d. ... 484 .. |
| 8. £639 12s. 2¼d. ... 102 rem. | 25. £510 7s. 11¼d. ... 2002 .. |
| 9. £1440 12s. 5¾d. ... 35 .. | 26. £261 8s. 5½d. ... 1840 .. |
| 10. £456 0s. 0d. ... 50 .. | 27. £39 9s. 5½d. ... 128 .. |
| 11. £92 16s. 8¾d. ... 262 .. | 28. £144 14s. 11¼d. ... 1551 .. |
| 12. £243 18s. 4½d. ... 191 .. | 29. £350 15s. 6¼d. ... 999 .. |
| 13. £83 13s. 4d. ... 443 .. | 30. £97 13s. 7¼d. ... 7017 .. |
| 14. £38 19s. 6d. ... 669 .. | 31. 95 lbs. 6 oz. 16 dwts. 18 grs. |
| 15. £79 1s. 6½d. ... 93 .. | 32. 7 lbs. 3 oz. 9 dwts. 7 grs. |
| 16. £78 18s. 9d. ... 110 .. | 33. 33 tons, 17 cwt. 3 qrs. 14 lbs. |
| 17. £88 15s. 8d. ... 190 .. | 34. 76 cwt. 1 qr. 11 lbs. 15 oz. |
| 35. 9 mi. 0 furs. 23 po. 3 yds. 2 ft. 6 in. ... 392 rem. | |
| 36. 9 mi. 4 furs. 29 po. 4 yds. 1 ft. 5 in. ... 879 .. | |
| 37. 2673 acres, 1 ro. 23 po. | |
| 38. 207 c. yds. 17 ft. 409 in. | |
| 39. 7 wks. 3 dys. 22 hrs. 55 mins. 44 secs. ... 250 rem. | |
| 40. 10 yrs. 3 mo. 2 wks. 0 dys. 20 hrs. 23 min. 43 secs. ... 489 rem. | |

Ex. VIII. (p. 7.)

- | | | | | |
|----------|----------|---------|---------|----------|
| 1. 251. | 3. 9999. | 5. 897. | 7. 408. | 9. 568. |
| 2. 9416. | 4. 4196. | 6. 635. | 8. 559. | 10. 964. |

Ex. IX. (p. 7.)

- | | |
|--------------------|--|
| 1. £18 15s. 10d. | 2. 14 yrs. 306 dys. 16 hrs. |
| 3. 1364. | 4. $5\frac{1}{2}$ yds. |
| 6. 3 mi. 120 yds. | 7. 270 cwt. |
| 9. 55 mi. 270 yds. | 10. 8 mins. $14\frac{4892}{48087}$ secs. |
11. $2859\frac{11}{16}$ crowns, $5718\frac{11}{16}$ half-crowns, $57189\frac{11}{16}$ threepenny pieces, $228759\frac{1}{2}$ threefarthing pieces. 12. 5s. 6d.
- | | |
|--|--|
| 13. 447 lbs., $43\frac{3}{4}$. | 14. £1717 0s. $7\frac{1}{2}$ d., 22275. |
| 15. £848 14s. $4\frac{1}{2}$ d. | 16. 2 yds. 2 ft. 3 in. |
| 18. one 2 cwt. 2 qrs. 11 lbs., two 2 cwt. 1 qr. 17 lbs. | 17. £52 8s. 2d. |
| 19. 1420, 2330. | 20. 90. |
| 22. £344 2s. $0\frac{1}{2}$ d. | 21. 60 at 12d. 180 at 16d. |
| 23. 14 acres. | 24. £17 16s. $10\frac{1}{2}$ d. |
| 25. 74 roods, 31 po. 23 yds. $6\frac{1}{2}$ ft. | 26. 5s. 5d. |
| 27. $7155\frac{3}{8}$. | 28. £2863 16s. |
| 30. $176\frac{2}{3}$. | 29. $15441\frac{2}{3}$. |
| 31. £647 10s. | 32. £747500 and $31944\frac{1}{2}$. |
| 33. 3 m. 2 fur. 28 po. 6 in.; diff. 3 in. | 34. $444\frac{1}{2}$. |
| 35. Captain's £309 11s. 8d.; each sailor's £7 14s. $9\frac{1}{2}$ d. | |
| 36. £2 10s.; he loses £1 11s. 6d. | 37. 420. |
| 38. Master's £3145 3s. 4d.; each man's £349 9s. $3\frac{3}{8}$ d. | |
| 39. £149 12s. $4\frac{3}{4}$ d.; $10\frac{1}{8}\frac{1}{2}$ d. | 40. 840 men. |
| 41. £104 5s. and 17s. $4\frac{1}{2}$ d. | 42. 15; 80. |
| 43. 900. | |
| 44. 30 men, 15 boys. | 45. 1130, 904. |
| 46. £240, 720s., 960d. | |
| 47. 98. | 48. Gentlemen £420; Ladies £336. |
| 49. 963. | |
| 50. 311 omnibusses, 622 horses, 1866 cabs, 6220 foot passengers. | |
| 51. 30. | 52. £2 5s. 2d. for two; £6 15s. 6d. for one. |
| 53. 56250 French, 46875 English, 37500 Turks, 9375 Sardinians. | |
| 54. 300. | 55. 600, 500. |
| 56. 9s. $8\frac{1}{2}$ d. | |
| 57. £394 0s. 3d. | 58. £41 13s. $4\frac{1}{2}$ d.; 2s. $1\frac{1}{2}\frac{1}{2}$ d. |
| 59. 204. | 60. 10 parts. |
| 61. gain £1 17s. 6d. | |
| 62. £7 10s. | 63. £77 9s. 10d. |
| 64. £1 3s. 9d. | |
| 65. £1159 10s. $5\frac{1}{2}$ d. | 66. lose £33 9s. $6\frac{1}{2}\frac{3}{8}$ d. |

Ex. X. (p. 13.)

- | | | | | |
|--------|--------|----------|---------|---------|
| 1. 56. | 5. 17. | 9. 267. | 13. 89. | 17. 73. |
| 2. 5. | 6. 4. | 10. 403. | 14. 13. | 18. 6. |
| 3. 7. | 7. 11. | 11. 201. | 15. 47. | 19. 29. |
| 4. 97. | 8. 12. | 12. 3. | 16. 31. | 20. 13. |

Ex. XI. (p. 13.)

1. 27720.	5. 2227680.	9. 1080.	13. 166320.
2. 5040.	6. 720720.	10. 11088.	14. 2646000.
3. 2160.	7. 2520.	11. 112200.	15. 1008.
4. 840.	8. 997920.	12. 18000.	16. 10080.

Ex. XII. (p. 14.)

1. 260865.	8. 165950532.	14. 110250.	20. 11589240.
2. 2663667.	9. 20736.	15. 884520.	21. 8493876.
3. 27300.	10. 31358925.	16. 1061106.	22. 3946110.
4. 576576.	11. 3008745.	17. 6191025.	23. 12229469.
5. 26153820.	12. 6038604.	18. 4845204.	24. 2017790775.
6. 22176.	13. 35307776.	19. 652379.	25. £21.
7. 124200.			

Ex. XIII. (p. 14.)

1. $\frac{11}{20}$	6. $\frac{238}{285}$	11. $\frac{19}{21}$	15. $\frac{13}{131}$
2. $\frac{7}{8}$	7. $\frac{31}{2642}$	12. $\frac{2}{7}$	16. $\frac{61}{254}$
3. $\frac{73}{81}$	8. $\frac{41}{329}$	13. $\frac{3268}{4479}$	17. $\frac{111}{2093}$
4. $\frac{111}{421}$	9. $\frac{11}{13}$	14. $\frac{2687}{3218}$	18. $\frac{74168}{98953}$
5. $\frac{113}{764}$	10. $\frac{37}{41}$		

Ex. XIV. (p. 15.)

1. $\frac{55}{42}$	4. $\frac{907}{180}$	7. $\frac{1255}{336}$	10. $\frac{230435}{66}$
2. $\frac{923}{210}$	5. $\frac{307}{56}$	8. $\frac{5955}{957}$	11. $\frac{901218}{171}$
3. $\frac{479}{168}$	6. $\frac{947}{112}$	9. $\frac{3450}{7}$	12. $\frac{842100}{4297}$

Ex. XV. (p. 15.)

1. $\frac{1103}{107}$	4. $\frac{9313}{4783}$	7. $\frac{59112}{1035}$	10. $\frac{47985}{467}$
2. $\frac{125}{143}$	5. $\frac{15117}{113}$	8. $\frac{87848}{113}$	11. $\frac{2075107}{1364}$
3. $\frac{3177}{1885}$	6. $\frac{3817}{245}$	9. $\frac{11315}{115}$	12. $\frac{8967244}{380}$

Ex. XVI. (p. 15.)

- | | |
|---|---|
| 1. $\frac{42, 45, 96, 144, 40}{72}$ | 6. $\frac{1914, 2052, 2001, 1634, 493}{3306}$ |
| 2. $\frac{135, 150, 160, 126, 2160}{360}$ | 7. $\frac{980, 525, 640, 308, 805}{1680}$ |
| 3. $\frac{98, 100, 96, 165, 60}{210}$ | 8. $\frac{700, 315, 2016, 490, 1800}{840}$ |
| 4. $\frac{336, 224, 3507, 200, 840}{840}$ | 9. $\frac{135, 546, 153, 610, 518}{630}$ |
| 5. $\frac{8640, 3276, 975, 3822, 5040}{5460}$ | 10. $\frac{880, 936, 999, 1530, 225}{1080}$ |

Ex. XVII. (p. 15.)

- | | | | |
|---------------------------------|---------------------------------|---|---------------------|
| 1. $\frac{7}{8}$. | 4. $\frac{7\frac{1}{2}}{8}$. | 7. $\frac{4\frac{1}{2}}{8}$. | 10. 1. |
| 2. $\frac{9\frac{1}{2}}{8}$. | 5. $\frac{2\frac{1}{2}}{8}$. | 8. $\frac{5\frac{3}{4}}{13\frac{7}{8}}$. | 11. $\frac{1}{2}$. |
| 3. $\frac{14\frac{1}{2}}{16}$. | 6. $\frac{2\frac{9}{10}}{16}$. | 9. $\frac{56\frac{5}{11}}{11}$. | 12. 3. |

Ex. XVIII. (p. 16.)

- | | | | |
|---|---|--|--|
| 1. $\frac{1\frac{1}{2}}{17}$. | 6. $\frac{25\frac{4\frac{1}{2}}{11}}{11}$. | 11. $\frac{50\frac{2\frac{1}{2}}{3\frac{1}{2}}}{3\frac{1}{2}}$. | 16. $\frac{2653\frac{2}{5}}{25}$. |
| 2. $\frac{2\frac{1}{2}}{18}$. | 7. $\frac{15\frac{4\frac{1}{2}}{50}}{50}$. | 12. $\frac{31\frac{1}{2}}{5}$. | 17. $\frac{21\frac{20\frac{1}{2}}{20}}{20}$. |
| 3. $\frac{1\frac{1}{2}}{25}$. | 8. $\frac{49\frac{1}{2}}{56}$. | 13. $\frac{38\frac{8\frac{1}{2}}{600}}{600}$. | 18. 2900. |
| 4. $\frac{14\frac{4\frac{1}{2}}{100000}}{100000}$. | 9. $\frac{91\frac{1}{2}}{88}$. | 14. $\frac{55\frac{2\frac{1}{2}}{238}}{238}$. | 19. $\frac{5\frac{4\frac{1}{2}}{30}}{30}$. |
| 5. $\frac{39\frac{2\frac{1}{2}}{8}}{8}$. | 10. $\frac{167\frac{4\frac{1}{2}}{84}}{84}$. | 15. $\frac{25\frac{4\frac{1}{2}}{98960}}{98960}$. | 20. $\frac{12\frac{2\frac{1}{2}}{220}}{220}$. |
| 21. £303 15s. $\frac{3\frac{1}{2}}{20}$ d. | | 23. 135 tons. 3 cwt. 2 qrs. $\frac{27\frac{9}{16}}{16}$ lbs. | |
| 22. £2865 13s. $\frac{7\frac{3}{4}}{120}$ d. | | 24. 3489 acres. 3 ro. $\frac{21\frac{3}{4}}{168}$ po. | |

Ex. XIX. (p. 17.)

- | | | | |
|--|---------------------------------|---|----------------------------------|
| 1. $\frac{5\frac{1}{2}}{24}$. | 6. $\frac{10\frac{1}{2}}{20}$. | 11. $\frac{4\frac{1}{2}}{16}$. | 16. $\frac{11\frac{1}{2}}{23}$. |
| 2. $\frac{8\frac{1}{2}}{18}$. | 7. $\frac{6\frac{1}{2}}{25}$. | 12. $\frac{8\frac{1}{2}}{15}$. | 17. $\frac{13\frac{1}{2}}{36}$. |
| 3. $\frac{6\frac{1}{2}}{17}$. | 8. $\frac{1\frac{1}{2}}{8}$. | 13. $\frac{7}{8}$. | 18. $\frac{11\frac{1}{2}}{10}$. |
| 4. $\frac{8\frac{1}{2}}{24}$. | 9. $\frac{3\frac{1}{2}}{26}$. | 14. $\frac{4\frac{1}{2}}{16}$. | 19. $\frac{27\frac{1}{2}}{8}$. |
| 5. $\frac{35\frac{1}{2}}{47}$. | 10. $\frac{2\frac{1}{2}}{20}$. | 15. $\frac{5\frac{1}{2}}{24}$. | 20. $\frac{7\frac{1}{2}}{8}$. |
| 21. £94 12s. $\frac{0\frac{9}{88}}{88}$ d. | | 23. 12 cwt. 0 qr. 19 lbs. $\frac{13\frac{1}{100}}{100}$ oz. | |
| 22. £177 2s. $\frac{6\frac{1}{2}}{12}$ d. | | 24. 31 yds. 1 ft. $\frac{7\frac{1}{2}}{12}$ in. | |

Ex. XX. (p. 17.)

- | | | | |
|--------------------------------|--------------------------------|---------------------------------|----------------------------------|
| 1. $\frac{1\frac{1}{2}}{24}$. | 5. $\frac{8\frac{1}{2}}{20}$. | 9. $\frac{11\frac{1}{2}}{20}$. | 13. $\frac{45\frac{1}{2}}{20}$. |
| 2. $\frac{7\frac{1}{2}}{20}$. | 6. $\frac{9\frac{1}{2}}{8}$. | 10. $\frac{9\frac{1}{2}}{20}$. | 14. $\frac{5\frac{1}{2}}{16}$. |
| 3. $\frac{4\frac{1}{2}}{8}$. | 7. $\frac{12\frac{1}{2}}{8}$. | 11. $\frac{7\frac{1}{2}}{16}$. | 15. $\frac{16\frac{1}{2}}{11}$. |
| 4. $\frac{6\frac{1}{2}}{8}$. | 8. $\frac{5\frac{1}{2}}{8}$. | 12. $\frac{6\frac{1}{2}}{8}$. | 16. $\frac{12\frac{1}{2}}{8}$. |

Ex. XXI. (p. 18.)

- | | | |
|---|---------------------------|----------------------------|
| 1. 601758 $\frac{3}{4}$, 143663 $\frac{1}{2}$, 430085 $\frac{5}{8}$. | 5. $1\frac{39}{44}$. | 9. $\frac{7}{17}$. |
| 2. 39703 $\frac{1}{12}$, 13299 $\frac{2}{3}$, 172184 $\frac{5}{11}$. | 6. 255632 $\frac{3}{4}$. | 10. 357 $\frac{51}{248}$. |
| 3. $\frac{2}{35}$. | 7. $\frac{147}{160}$. | 11. $\frac{5}{8}$. |
| 4. $\frac{1}{3}$. | 8. $\frac{9}{20}$. | 12. 5 $\frac{19}{28}$. |

Ex. XXII. (p. 18.)

- | | | | |
|-----------------------|-----------------------|---------------------|----------------------|
| 1. $1\frac{31}{42}$. | 4. $1\frac{27}{28}$. | 7. $1\frac{1}{2}$. | 9. 3. |
| 2. $2\frac{11}{12}$. | 5. $31\frac{1}{2}$. | 8. $\frac{1}{12}$. | 10. $\frac{1}{12}$. |
| 3. $1\frac{1}{2}$. | 6. $3\frac{1}{4}$. | | |

Ex. XXIII. (p. 18.)

- | | |
|---|---|
| 1. $\frac{45}{58}$, 2 $\frac{1}{2}$, $5\frac{1}{2}$, $10\frac{1}{2}$, $31\frac{7}{16}$. | 2. $14\frac{203}{248}$, $\frac{71}{60}$, $\frac{64}{81}$, $\frac{53}{122}$. |
| 3. $1\frac{21}{48}$, $2\frac{1}{2}$. | 4. $1\frac{23}{48}$, $42\frac{5}{8}$. |
| 5. $\frac{5}{12}$, $11\frac{1}{3}$, $8\frac{2}{3}$. | 6. $\frac{1}{10}$, $18\frac{1}{2}$. |
| 7. $\frac{7}{256}$. | 8. $2\frac{19}{80}$, $\frac{68}{157}$, $27\frac{1}{81}$. |
| 9. $2\frac{1}{2}$. | 10. $10\frac{1}{2}$. |
| 11. $18\frac{88}{89}$. | 12. $10\frac{1}{2}$. |
| 13. $9\frac{1}{2}$. | 14. $\frac{7}{15}$, $\frac{7}{8}$. |
| 15. $\frac{1}{8}$. | 16. $\frac{7}{8}$, $8\frac{1}{2}$, $1\frac{1}{4}$. |
| 17. $\frac{11}{80}$. | 18. $\frac{3}{28}$, $1\frac{1}{2}$. |
| 19. $2\frac{21}{48}$. | 20. $12\frac{9}{16}$. |
| 21. $2\frac{244}{441}$. | 22. $\frac{5}{118}$. |
| 23. $\frac{5}{13}$, $\frac{1}{2}$. | 24. $1\frac{297}{248}$. |
| 25. $\frac{1}{2}$. | 26. $\frac{2}{3}$. |
| 27. $39\frac{2881}{16880}$. | 28. $5\frac{1}{2}$. |
| 29. $\frac{5}{12}$. | 30. $5\frac{1}{2}$. |
| 31. 15. | 32. $5\frac{1}{2}$. |
| 33. $1\frac{10}{11}$. | 34. $8\frac{249}{248}$. |
| 35. $20\frac{1}{4}$, $37\frac{1}{2}$, $12\frac{3}{8}$, $17\frac{1}{2}$. | 36. $14\frac{40}{683}$, $68\frac{2003}{3318}$. |
| 37. $54\frac{1}{2}$. | 38. $17\frac{83}{240}$. |
| 39. $9\frac{5}{8}$, $6\frac{5}{12}$, $13\frac{9}{32}$, $64\frac{7}{48}$. | 40. $\frac{1}{6}$. |
| 41. $15\frac{3}{8}$. | 42. $43\frac{103}{240}$. |
| 43. $14\frac{1}{2}$, $4\frac{58}{89}$, $28\frac{57}{284}$, $4\frac{71}{126}$. | 44. $1\frac{208}{918}$. |
| 45. $3\frac{17}{48}$, $18\frac{11}{12}$, $9\frac{7}{24}$, $8\frac{1}{2}$. | 46. $18\frac{9}{16}$. |
| 47. $\frac{1}{8}$. | 48. $33\frac{841}{1470}$. |
| 49. 0. | 50. $41\frac{97}{468}$. |
| 51. $58\frac{644}{355}$. | 52. $13\frac{3}{4}$. |
| 53. $\frac{1}{2}$. | 54. 1. |
| 55. $1\frac{1}{2}$, $4\frac{83}{210}$, $10\frac{1}{2}$. | 56. $38\frac{861}{860}$. |
| 57. $1\frac{23}{20}$, $1\frac{1}{2}$, $\frac{1}{2}$, $1\frac{1}{16}$, $1\frac{57}{160}$. | 58. $4\frac{1}{6}$. |
| 59. $1\frac{1}{2}$. | 60. $14\frac{1}{8}$, $20\frac{127}{180}$, $12\frac{1}{15}$. |
| 61. $1\frac{1}{2}$, $-5\frac{27}{56}$, $-8\frac{51}{112}$, $-32\frac{47}{336}$. | 62. $8\frac{199}{288}$. |
| 63. $\frac{28}{135}$. | |

Ex. XXIV. (p. 22.)

- | | |
|---|---|
| 1. £416 12s. 8 $\frac{1}{2}$ d. | 2. £510 1s. 7 $\frac{1}{2}$ d. |
| 3. 3 qrs. 21 lbs. | 4. £125 4s. 6d. |
| 5. £3184 5s. 7 $\frac{1}{2}$ d. | 6. £569 4s. 1 $\frac{3}{8}$ d. |
| 7. 13 cwt. 2 qrs. 19 $\frac{3}{4}$ lbs. | 8. 39 lbs. 3 oz. 16 dwts. 13 $\frac{1}{2}$ gra. |
| 9. £1 18s. | 10. £2 10s. |
| 11. £480 4s. 4d. | 12. £3 3s. 3 $\frac{1}{2}$ d. |

- | | |
|---------------------------|----------------------------|
| 13. £214 17s. 3½d. | 14. £5 1s. 1¾d. |
| 15. £4 2s. 1¾d. | 16. £1084 8s. 7d. |
| 17. 18 ms. 0 fur. 14¼ po. | 18. 1s. 10½d. |
| 19. 1s. 8¼d. | 20. 3 roods 0 po. 19¼ yds. |
| 21. 15s. 8⅓d. | 22. 3492¾ yds. |
| 23. — 23491⅔ yds. | 24. 1¼s. 1¼s. 1¼s. |

Ex. XXV. (p. 23.)

- | | | | |
|------------------------------------|-------------------------|-------------------------|--------------------------|
| 1. $\frac{3}{5}$ | 6. $\frac{171}{44800}$ | 11. $\frac{4}{9}$ | 16. $\frac{5728}{13475}$ |
| 2. $\frac{5}{6}$ | 7. $\frac{245}{447}$ | 12. $\frac{4096}{5445}$ | 17. $\frac{207}{223}$ |
| 3. $\frac{359}{31680}$ | 8. $\frac{8}{9}$ | 13. $\frac{75}{224}$ | 18. $\frac{1339}{5103}$ |
| 4. $\frac{1}{288}, \frac{1}{1440}$ | 9. $\frac{189}{640}$ | 14. $\frac{392}{605}$ | 19. $\frac{13}{24}$ |
| 5. $\frac{16}{27}$ | 10. $\frac{378}{11135}$ | 15. $\frac{315}{404}$ | |

Ex. XXVI. (p. 24.)

- | | | | |
|--|---|--|---|
| 1. $1\frac{5}{12}$. | 2. $4\frac{2}{3}$. | 3. $30\frac{1}{2}$. | 4. $\frac{4}{5}$ greatest, $\frac{1}{5}$ least. |
| 5. $\frac{13}{24}$. | 6. $\frac{4}{5}$. | 7. $1\frac{9}{16}$. | 8. 10s. |
| 9. £156. | 10. $\frac{7}{180}$. | 11. $\frac{3}{11}$. | 12. $\frac{143}{180}, \frac{19}{24}, \frac{1}{360}$. |
| 13. $12\frac{19}{180}$. | 14. $\frac{7}{8}$. | 15. $1\frac{1}{2}\frac{5}{188}$. | 16. £3 7s. 4d. |
| 17. 22 ft. $8\frac{8}{11}$ in. | 18. £464 6s. $4\frac{9}{12}$ d. | 19. $7\frac{308}{2813}$ d. | 20. $208\frac{11}{12}$ dr. |
| 21. £395 19s. 4d.; £11614 11s. 8d. | | 22. $\frac{1}{8}\frac{1}{2}$. | |
| 23. $\frac{23}{48}, 26\frac{23}{48}$ guineas. | | 24. £2 5s. 10d. by A; £2 1s. 8d. by B. | |
| 25. A gain of 1s. per lb. Troy. | | 26. $5\frac{5}{11}$, or $38\frac{2}{11}$ mins. past 10. | |
| 27. 1 m. 249 yds. $0\frac{1}{2}$ ft. | | 28. $19\frac{7}{12}$ miles. | 29. £1 13s. 7½d. |
| 30. £8 8s. 8d.; A gathers 34 2s. 1d., B £1 4s. 2d., C £2 1s. 4d. | | | |
| 31. 120; score of each, 15, 12, 12, 6, 6, 6, 15, 15, 15, 15, 3. | | | |
| 32. 100. | 33. £333 6s. 8d.; $\frac{1}{30}$. | | |
| 34. $\frac{1}{10}, \frac{13}{20}, \frac{19}{30}, \frac{2}{5}, \frac{28859}{20000}, \frac{11}{20}, \frac{1}{2}, \frac{1}{12}$. | | 35. 36. | |
| 36. To $\frac{1}{8}$, by $\frac{1}{12}$. | 37. 25s. | 38. £1320 6s. | |
| 39. £15 6s. 3d. | 40. $89\frac{11}{16}$. | 41. B 6d., C 2s. 6d. | |
| 42. £22 8s. | 43. 192000 miles; 20,000,000,000,000 miles. | | |

Ex. XXVII. (p. 28.)

- | | | |
|-----------------|------------------|-------------------|
| 1. 525-963. | 5. 129-0957967. | 9. 4002-1441415. |
| 2. 125-125. | 6. 544-0703. | 10. 46-704217. |
| 3. 3840-403699. | 7. 133-7951526. | 11. 1032-981262. |
| 4. 1735-52843. | 8. 2375-4562109. | 12. 588-01551757. |

Ex. XXVIII. (p. 28.)

- | | | |
|---------------|---------------------|-----------------|
| 1. .09. | 8. 61·4999573. | 15. 7·603082. |
| 2. ·9227. | 9. 22·040763218. | 16. 94·9553. |
| 3. ·99999. | 10. 3·909299315062. | 17. 216·285497. |
| 4. 30·718902. | 11. 9·59384. | 18. 772·844901. |
| 5. 911·28164. | 12. 37·184. | 19. 107·089806. |
| 6. 16·450374. | 13. 30·38824. | 20. 4·63739. |
| 7. 251·35235. | 14. 11·533845035. | |

Ex. XXIX. (p. 28.)

- | | | |
|------------------|-------------------|-------------------|
| 1. 122·122. | 8. ·05968964. | 15. ·000001. |
| 2. 3·717184. | 9. 225·96942. | 16. ·00072. |
| 3. ·0005758775. | 10. 44·9992924. | 17. ·021042. |
| 4. ·00003738028. | 11. ·019203902. | 18. ·00005955831. |
| 5. ·0000461652. | 12. 2·14065592. | 19. ·011214084. |
| 6. 115·469802. | 13. 109·45871624. | 20. 5·1839697712. |
| 7. 4·5369702. | 14. ·000097888. | |

Ex. XXX. (p. 29.)

- | | | |
|-------------------|----------------------|-------------------|
| 1. 3·012. | 16. 30,000. | 31. 10·51384615̇. |
| 2. 750. | 17. 34·4352405 +. | 32. 59640. |
| 3. ·0025. | 18. 3·0703̇. | 33. 222340. |
| 4. ·057. | 19. 2·343̇. | 34. ·057. |
| 5. 813·4. | 20. 71·9996400017 +. | 35. 711·858. |
| 6. ·0072. | 21. 24,000. | 36. ·00041. |
| 7. ·0158878 +. | 22. 7142857·142857̇. | 37. 1·01650133 +. |
| 8. ·18512518 +. | 23. 12·045̇. | 38. 1·90000486 +. |
| 9. 77441·3̇. | 24. 3·47247̇. | 39. 1·11771955 +. |
| 10. 195395·2. | 25. ·00000014. | 40. ·00910776. |
| 11. 87756·95121̇. | 26. 4·878004̇. | 41. ·0007. |
| 12. 457·037̇. | 27. 81·4632. | 42. 239·19. |
| 13. ·45703̇. | 28. ·00168891̇. | 43. 13·7827776. |
| 14. 457037·037̇. | 29. 38·095238̇. | 44. 1·569995̇. |
| 15. 25·991735 +. | 30. 446666̇. | 45. 32236·38. |
| | | 46. 950·7065̇. |

Ex. XXXI. (p. 30.)

- | | | |
|------------|------------------|----------------------|
| 1. 7·425. | 4. 9·00764. | 7. 3·1416. |
| 2. 5·0625. | 5. 4·175. | 8. ·00546875. |
| 3. 11·848. | 6. 6·0005859375. | 9. ·0000005425394 +. |

- | | | |
|----------------------|-----------------|------------------|
| 10. .000003426879 +. | 17. .738095238. | 24. .16296. |
| 11. .000001019975 +. | 18. 6.060975. | 25. .96875. |
| 12. .000010370109 +. | 19. 2.43657. | 26. .625. |
| 13. .036. | 20. 6.70003. | 27. 562.926. |
| 14. 8.259. | 21. 20.20204. | 28. 2.7182818 +. |
| 15. 17.0009. | 22. 2.380952. | 29. 3.1415926 +. |
| 16. 14.3571428. | 23. 1.12345. | 30. .54930371 +. |

Ex. XXXII. (p. 30.)

- | | | | |
|-----------------------------|---------------------------|------------------------------|-------------------------------|
| 1. $\frac{2^3}{160}$. | 10. $27\frac{9}{3200}$. | 19. $\frac{1013}{1110}$. | 28. $7\frac{1}{1300}$. |
| 2. $\frac{1^3}{1280}$. | 11. $14\frac{1}{16000}$. | 20. $\frac{313423}{18880}$. | 29. $27\frac{3}{4}$. |
| 3. $\frac{1}{256}$. | 12. $3\frac{63}{8000}$. | 21. $6\frac{7}{8}$. | 30. $1\frac{3}{4}$. |
| 4. $\frac{49}{25600}$. | 13. $\frac{1}{8}$. | 22. $17\frac{111}{33300}$. | 31. 314237 . |
| 5. $12\frac{3}{4}$. | 14. $\frac{13}{98}$. | 23. $9\frac{13}{8000}$. | 32. $2\frac{837}{8800}$. |
| 6. $224\frac{99}{8000}$. | 15. $\frac{29}{98}$. | 24. $25\frac{1411}{3330}$. | 33. $\frac{418803}{111110}$. |
| 7. $17\frac{331}{400000}$. | 16. $4\frac{1}{10}$. | 25. $14\frac{79}{180}$. | 34. $\frac{8279}{496000}$. |
| 8. $5\frac{912}{125000}$. | 17. $\frac{19}{180}$. | 26. $3\frac{3800}{33000}$. | 35. $64\frac{2861}{330000}$. |
| 9. $24\frac{6133}{62500}$. | 18. $\frac{284}{495}$. | 27. $2\frac{23}{833000}$. | 36. $45\frac{3557}{49950}$. |

Ex. XXXIII. (p. 31.)

- | | | |
|-------------------|--------------------|---------------------|
| 1. 1101.680021. | 5. 228.06158069. | 9. 2366.7156105. |
| 2. 132.85357448. | 6. 3840.403800618. | 10. 305.6461725807. |
| 3. 972.8587214. | 7. 462.5694187369. | 11. 1125.854289198. |
| 4. 201.214221676. | 8. 1015.72311038. | 12. 3139.9419072. |

Ex. XXXIV. (p. 31.)

- | | | |
|-------------------|------------------|-----------------|
| 1. 6.1198865. | 7. .0001638. | 13. .00416. |
| 2. 108.0803348. | 8. .106546823. | 14. 26.413. |
| 3. 67.920164728. | 9. 1.9044991793. | 15. .80563. |
| 4. 100.839235301. | 10. 7.242173. | 16. 5.123. |
| 5. 1000.699920. | 11. 6.114237. | 17. 10.603. |
| 6. 162.0855299. | 12. 9.37024. | 18. 61.4739835. |

Ex. XXXV. (p. 32.)

- | | | |
|-------------------|---------------------|-----------------|
| 1. 5·06081. | 9. 232·3313633675. | 17. ·18. |
| 2. 15·6951219. | 10. 6·79365521960. | 18. 6·3089390+. |
| 3. 96·541544. | 11. 17·37620519749. | 19. ·036. |
| 4. 26·47666807. | 12. 143·0666271486. | 20. ·008. |
| 5. 8·92930. | 13. ·001. | 21. ·323863. |
| 6. 44·2567026655. | 14. 2·6. | 22. ·29954. |
| 7. 144·41355308. | 15. ·004. | 23. ·01336. |
| 8. ·090820089. | 16. 14·7. | 24. 4·34375. |

Ex. XXXVI. (p. 32.)

- | | | |
|-------------|-------------|-----------------------------|
| 1. 1·16. | 6. 8·24. | 11. 7. |
| 2. ·857142. | 7. ·3. | 12. ·9285714. |
| 3. 13·3. | 8. ·175. | 13. ·3198253. |
| 4. ·03. | 9. 4·09. | 14. ·04701. |
| 5. ·297. | 10. 48·734. | 15. 28335 $\frac{11}{28}$. |

Ex. XXXVII. (p. 33.)

- | | | |
|---|--|---------------------------------|
| 1. 16s. 3d.; £1 13s. 5·807d. | 2. 4 cwt. 2 qrs. 21 lbs.; 2 cwt. 17 lbs. 15 oz. | |
| 3. £12 11s. 5·616d.; £11 19s. 5·92d. | | |
| 4. £79 8s. 10·368d.; £45 11s. 7·32864d. | | |
| 5. 12 tons, 6 cwt. 3 qrs. 22·4 lbs.; 14 tons, 3 qrs. 17·43 lbs. | | |
| 6. 36 miles, 4 furs. 4·928 yds.; 27 miles, 7 furs. 39 po. 4·28 yds. | | |
| 7. 13 lbs. 11 oz. 15 dwts. 1·344 grs.; 26 lbs. 4 dwts. 3·168 grs. | | |
| 8. 10s. 6d. | 9. £4 6s. 5·946d. | |
| 10. £2 10s. 7d. | 11. 12 tons, 18 cwt. 2 qrs. 16·117 lbs. | |
| 12. £2 8s. 1·518d. | 13. £2 0s. 6·0417d. | |
| 14. 12 cwt. 1 qr. 17·466 lbs. | 15. 1 cwt. 2 qrs. 20·167 lbs. | |
| 16. 167 acres, 2 ro. 3 po. 25·865 yds. | 17. 2s. 5 $\frac{3}{8}$ d.; £4 13s. 8 $\frac{1}{8}$ d. | |
| 18. 8s. 9·7501d.; £5 12s. 7·39351d. | | |
| 19. 29 days, 12 hrs. 44 mins. 2·82 secs.; 5 dys. 12 hrs. 25 mins. 37·92 secs. | | |
| 20. (1) £105 2s. 10 $\frac{1}{2}$ d. | (3) £12 12s. 6d. | (5) £15 6s. 3d. |
| (2) £6 3s. 6d. | (4) £27 7s. 3 $\frac{3}{8}$ d. | (6) £8 2s. 1 $\frac{61}{28}$ d. |

Ex. XXXVIII. (p. 34.)

- | | |
|-------------------------|-------------------------|
| 1. ·628125; ·239285714. | 3. 3·590625; 1·43625. |
| 2. ·153125; ·1452569 +. | 4. ·296527; ·2812911 +. |

- | | |
|--------------------------|------------------------------|
| 5. 2759875; 331125. | 14. 0000363005; 01183207. |
| 6. 6438492063. | 15. 900449322089947. |
| 7. 44472. | 8. 7317. |
| 9. 55380952. | 16. 8602678571428; 4121043+. |
| 10. 192506. | 11. 27. |
| 12. 002739726+. | 17. 907954; 11940967+. |
| 13. 748509. | 18. 43175; 8429681+. |
| | 19. 17486805; 1737243+. |
| | 20. 8455. |
| | 21. 016. |
| 22. (1) 3 c. 1½ m. | (7) £100 7 fl. 2 c. 5 m. |
| (2) £24 7 fl. 5 c. | (8) £12 1 fl. 7 c. 5 m. |
| (3) £41 4 fl. 3 c. 7½ m. | (9) £19 1 fl. 2 c. 5 m. |
| (4) £7 4 fl. 6 c. 5 m. | (10) £58 3 fl. 0 c. 7 m. |
| (5) £3 7 fl. 2 c. 4 m. | (11) £16 2 fl. 5 c. 7½ m. |
| (6) £8 6 fl. 1 c. 5 m. | (12) £11 2 fl. 5 c. 9 m. |

Ex. XXXIX. (p. 35.)

- | | |
|--|-----------------------------|
| 1. 28078; 170289; 0725. | 2. 210021021. |
| 3. 44445656. | 4. 1655808. |
| 5. 7313505607+. | |
| 6. 237. | 7. 7s. 1181d. |
| 8. £142 6s. 3d. | |
| 9. 112. | 10. 1 rood, 29.92 po. |
| 11. £100 0s. 0002625d. | |
| 12. 30540336. | 13. 512000. |
| 14. 876683. | |
| 15. 3, 1, 59, 2, 1, 87, 1. | 16. 1888; £192. |
| 17. 44725411507936. | 18. 9999 times the decimal. |
| 19. £148 9 fl. 2 c. 1 m. | 20. £11 16s. 9½d. |
| 21. £361 8 fl. 9 c. 9 m.; £18 3 fl. 9 c. 6½ m. | |
| 22. 31158730; 25510620+; 007; 5625; 6117; 10135. | |
| 23. 0. | 24. 04. |
| 25. 11804. | 26. 3104 days. |
| 27. 3772. | 28. 4 ft. 9136672 in. |
| 29. 24856843 miles. | |
| 30. 3635712 dwts. | 31. 34 yds. 2 ft. 11872 in. |
| 32. 10 ft. 4592 in. | 33. 7911980875 miles. |
| 34. 32811021296678+. | 35. 2062648. |
| 36. 002785515+. | |
| 37. 62 lbs. 5 oz. 23802 dms; 84133384 gals. | 38. 7057856 lbs. |
| 39. 391376 inches. | 40. 9535313035+ miles. |

Ex. XL. (p. 38.)

- | | |
|--------------------|--------------------|
| 1. £1103 12s. 8d. | 4. £2923 3s. 1½d. |
| 2. £13278 17s. 0d. | 5. £27820 18s. 3d. |
| 3. £1132 3s. 6d. | 6. £13903 10s. 6d. |

7. £82654 9s. 1d.	16. £242 12s. 0 $\frac{11}{16}$ d.
8. £247049 17s. 11 $\frac{1}{4}$ d.	17. £352 13s. 9 $\frac{7}{8}$ d.
9. £187733 16s. 7 $\frac{1}{2}$ d.	18. £40958 6s. 11 $\frac{5}{8}$ d.
10. £475529 19s. 9d.	19. £1869 2s. 3 $\frac{7}{8}$ d.
11. £1500088 2s. 4 $\frac{1}{2}$ d.	20. £1473 5s. 7 $\frac{1}{2}$ d.
12. £37377 5s. 0d.	21. £17350 11s. 10 $\frac{1}{2}$ d.
13. £185 0s. 4 $\frac{4}{5}$ d.	22. £38416 14s. 4 $\frac{4}{8}$ d.
14. £868 4s. 4 $\frac{11}{16}$ d.	23. £37097 2s. 10 $\frac{1}{14}$ d.
15. £32936 12s. 2 $\frac{3}{4}$ d.	24. £65981 18s. 8 $\frac{6}{11}$ d.

Ex. XLI. (p. 38.)

1. £250 7s. 9d.	21. £81 4s. 10 $\frac{1}{2}$ d.
2. £112 8s. 3 $\frac{3}{4}$ d.	22. £4266 17s. 9 $\frac{3}{4}$ d.
3. £21 19s. 1d.	23. £45 5s. 10 $\frac{5}{8}$ d.
4. £74086 8s. 7 $\frac{1}{2}$ d.	24. £742 11s. 2 $\frac{3}{4}$ d.
5. £8095 4s. 2 $\frac{1}{4}$ d.	25. £44 9s. 3 $\frac{3}{8}$ d.
6. £338 5s. 2 $\frac{3}{4}$ d.	26. £7 18s. 7 $\frac{37}{80}$ d.
7. £358 19s. 5 $\frac{1}{4}$ d.	27. 647 oz. 16 dwts. 0 $\frac{103}{144}$ grs.
8. £2162 12s. 1 $\frac{5}{8}$ d.	28. £517 14s. 5 $\frac{3}{16}$ d.
9. £12761 2s. 5 $\frac{3}{8}$ d.	29. £44 3s. 0 $\frac{1}{20}$ d.
10. £2208 9s. 8 $\frac{1}{2}$ d.	30. £129 15s. 10d.
11. £34 8s. 6d.	31. £548 8s. 8 $\frac{1}{2}$ d.
12. £951 19s. 10d.	32. £21 9s. 3 $\frac{1}{4}$ d.
13. £136 19s. 11d.	33. £574 3s. 11 $\frac{5}{14}$ d.
14. £44 14s. 6 $\frac{1}{2}$ d.	34. £1577 7s. 10 $\frac{2}{11}$ d.
15. £115 8s. 4 $\frac{5}{16}$ d.	35. £1312 14s. 10 $\frac{889}{1280}$ d.
16. £45 19s. 0 $\frac{11}{128}$ d.	36. £176 17s. 7 $\frac{1}{2}$ d.
17. £309 2s. 10 $\frac{1}{2}$ d.	37. £70 15s. 9 $\frac{971}{1280}$ d.
18. £2164 8s. 9 $\frac{11}{20}$ d.	38. £46 4s. 10 $\frac{1}{2}$ d.
19. 5 lbs. 11 oz. 15 $\frac{1}{2}$ grs.	39. £7 9s. 7 $\frac{1}{2}$ d.
20. £2854 15s. 5 $\frac{3}{8}$ d.	40. £40 8s. 3d.

Ex. XLII. (p. 40.)

1. $\frac{21}{20}$; 300; 70; .0279888 +.	2. 2.04228 +.	3. .00426.
4. 27 lbs. 6 oz. 6 dwts.	5. £1 0s. 2 $\frac{11}{16}$ d.	6. 2s. 3d.
7. 1 $\frac{1}{5}$ minute.	8. £562 3s. 2d.	9. 14s. 7 $\frac{1}{2}$ d.
10. £44 17s. 8 $\frac{13}{16}$ d.	11. 20s. 5 $\frac{5}{11}$ d.	12. £64 4s.

- | | |
|--|---|
| 13. 17s. $3\frac{4}{5}d.$ | 14. £1610; 4s. |
| 15. 6s. 8d.; £3333 6s. 8d., £3500, £116 13s. 4d. | |
| 16. £208 16s. 2d. | 17. £450. |
| 18. £760. | |
| 19. £580. | 20. 933 $\frac{1}{2}$ lbs. yearly; $2\frac{1}{2}d.$ lbs. daily. |
| 21. 38 yds. 0 qrs. $3\frac{1}{4}$ nls. | 22. $14\frac{2}{7}s.$ |
| 23. £9506 3s. $5\frac{1}{2}d.$ | |
| 24. £983 2s. $2\frac{3}{4}d.$ | 25. $3\frac{1}{2}$. |
| 26. 534 lbs. 8 oz. 13 dwts. 8 grs. | |
| 27. 1·945 c. in.; 37 lbs. | 28. $10\frac{3}{8}$ drs. Av.; 291 $\frac{3}{8}$ grs. Troy. |
| 29. £2 6s. $5\frac{1}{2}d.$ | 30. £2 14s. $7\frac{1}{2}d.$ |
| 31. 6s. 8d.; 12 oz. | |
| 32. 288. | 33. $11\frac{1}{4}$ hrs. |
| 34. 400. | |
| 35. 11s. 6d. | |
| 36. £1 8s. $11\frac{2}{3}d.$ | 37. $1\frac{3}{8}$ before 12. |
| 38. $4\frac{1}{8}$ days. | |
| 39. $4\frac{5}{8}$ days. | 40. $3\frac{2}{3}d.$ |
| 41. £3168000. | 42. £214 5s. $8\frac{1}{2}d.$; $2\frac{1}{8}d.$ |
| 43. $2\frac{1}{2}$ secs. slow. | 44. 231 miles. |
| 45. £6865 13s. $8\frac{9}{14}d.$ | |
| 46. 40 miles. | 47. 120 yds. |
| 48. 6 mi. 3 furs. $2\frac{4}{5}$ yds. | |
| 49. 2s. $1\frac{2}{3}d.$; $2\frac{2}{3}d.$ | 50. 275625. |

Ex. XLIII. (p. 44.)

- | | | |
|-----------------------------|------------------------------|------------------------------------|
| 1. £114 6s. | 14. 140. | 28. 48. |
| 2. 2440. | 15. 7 days 2 hours. | 29. 8. |
| 3. 15 cwt. | 16. £2 2s. $9\frac{1}{2}d.$ | 30. $5\frac{3}{15}$. |
| 4. 300. | 17. 25 tons 15 cwt. 2 qrs. | 31. £1 9s. $2\frac{2009}{10000}$. |
| 5. $3\frac{3}{8}$ days. | 18. 51. | 32. $22\frac{1}{2}$. |
| 6. 9. | 19. $23\frac{3549}{1125}$. | 33. 56. |
| 7. 500 reams. | 20. 18s. $1\frac{3}{8}d.$ | 34. 54. |
| 8. 20. | 21. $19\frac{9}{25}$. | 35. 10. |
| 9. $155\frac{1}{2}$. | 22. 300. | 36. 180. |
| 10. £61 18s. 5d. | 23. 12 cwt. 1 qr. 14 lbs. | 37. 27. |
| 11. £6 0s. $3\frac{3}{4}d.$ | 24. £6 2s. 6d. | 38. 164 dys. $6\frac{1}{3}$ hrs. |
| 12. 16. | 25. $2\frac{4}{5}$. | 39. 73. |
| 13. 98. | 26. 6. | 40. 90. |
| | 27. £97 0s. $4\frac{4}{5}d.$ | |

Ex. XLIV. (p. 47.)

- £9 3s. $5\frac{1}{2}d.$, £17 0s. $8\frac{1}{2}d.$
- £142 18s. to A, £224 11s. $1\frac{1}{2}d.$ to B, £347 0s. $10\frac{3}{4}d.$ to C.
- £36 3s., £54 4s. 6d., £66 5s. 6d.
- A £10 5s. $10\frac{1}{2}d.$, B £11 15s. $3\frac{1}{2}d.$, C £13 4s. $8\frac{1}{2}d.$, D £14 14s. $1\frac{1}{2}d.$
- House £584 7s. 6d., garden £265 12s. 6d.
- £10666 13s. 4d., £16000, £21333 6s. 8d.

7. 4 dwts. $16\frac{1}{2}$ grs. gold, $10\frac{5}{8}$ grs. copper.
8. £116 13s. 4d., £163 6s. 8d., £186 13s. 4d., £233 6s. 8d.
9. 300 lbs. 5 oz. $6\frac{1}{4}$ dwts. silver, 66 lbs. 9 oz. $3\frac{1}{4}$ dwts. alloy.
10. $57\frac{1}{2}$, $40\frac{2}{3}$, $91\frac{3}{8}$, $10\frac{3}{8}$.
11. $43\frac{1}{2}$ lbs. gold, $62\frac{3}{4}$ lbs. silver, $54\frac{3}{8}$ lbs. copper.
12. 12 cwt. nitre, 2 cwt. 1 qr. $16\frac{1}{2}$ lbs. charcoal, 1 cwt. 2 qrs. $11\frac{1}{2}$ lbs. sulphur.
13. $37\frac{1}{2}$ minutes. 14. £150, £300, £450.
15. 4 hrs. $12\frac{1}{2}$ mins. 16. £391, £529, £1311.
17. A receives and B pays £8 8s. 11d. 18. £83 17s. $10\frac{1}{2}$ d.
19. £20 17s. $3\frac{20}{121}$ d., £39 13s. $0\frac{11}{121}$ d., £59 9s. $7\frac{47}{121}$ d.
20. 65000 gals. 21. A £350, B £450. 22. £184 13s. $5\frac{181}{1000}$ d.
23. £112 16s. $8\frac{4}{9}$ d., £206 17s. $3\frac{5}{9}$ d., £310 5s. $11\frac{2}{9}$ d.
24. 135 cwt. 0 qrs. $22\frac{1}{2}$ lbs. 25. $8\frac{1}{2}$ cwt., $11\frac{1}{2}$ cwt.
26. 96 yds. at 12s. 6d., 108 yds. at 13s. 9d.

Ex. XLV. (p. 49.)

- | | |
|---|--|
| 1. 12 days. | 11. $3\frac{32}{107}$ days, $8\frac{4}{7}$ days. |
| 2. $2\frac{2}{3}$ days. | 12. 156 days. |
| 3. $17\frac{1}{2}$ mins. | 13. 10 days. |
| 4. 3 days. | 14. $2\frac{1}{3}$ days. |
| 5. $17\frac{4}{5}$ days. | 15. $3\frac{58}{109}$ days. |
| 6. $1\frac{9}{10}$ day; A in 5, B 6, C 7 days. | 16. $2\frac{1}{2}$ hours. |
| 7. 8 dys; A in $17\frac{1}{2}$, B 24, C 40 dys. | 17. $7\frac{837}{744}$ days. |
| 8. A and B in $3\frac{2}{3}$, C in $8\frac{1}{2}$ days. | 18. 3 hours. |
| 9. 120 hours. | 19. $2\frac{1}{8}$ hours, $2\frac{32}{121}$ hours. |
| 10. A 48 hrs., B 36 hrs., C $28\frac{4}{5}$ hrs.,
B and C $20\frac{4}{5}$ hrs. | 20. $57\frac{3}{5}$ hours. |

Ex. XLVI. (p. 51.)

- | | | |
|-----------|--------------------------------|-------------------------------|
| 1. 150. | 5. 4650. | 8. 114. |
| 2. 36450. | 6. £19 10s. $7\frac{1}{2}$ d., | 9. £10 14s. $3\frac{3}{4}$ d. |
| 3. 1632. | 25 francs = £1. | 10. Gains £11 5s. |
| 4. 2508. | 7. 80. | |

Ex. XLVII. (p. 52.)

- | | |
|-------------------------------|----------------------------------|
| 1. £41 2s. $11\frac{3}{4}$ d. | 5. £408 10s. $3\frac{3}{4}$ d. |
| 2. £42 3s. $6\frac{1}{5}$ d. | 6. £3502 15s. $0\frac{1}{2}$ d. |
| 3. £1 4s. $8\frac{3}{8}$ d. | 7. £240 0s. $2\frac{83}{100}$ d. |
| 4. £37 16s. $3\frac{1}{2}$ d. | 8. 10s. $2\frac{1}{5}$ d. |

- | | |
|----------------------------------|----------------------------------|
| 9. £4 7s. 6d. | 13. £1255 1s. 9 $\frac{1}{2}$ d. |
| 10. £673 16s. 6 $\frac{1}{2}$ d. | 14. £1 11s. 6 $\frac{3}{4}$ d. |
| 11. £845 0s. 0d. | 15. 18s 5 $\frac{3}{4}$ d. |
| 12. £810 6s. 9d. | 16. £419 15s. 5 $\frac{1}{2}$ d. |

Ex. XLVIII. (p. 53.)

- | | |
|-------------------------------------|------------------------------------|
| 1. £2 13s. 7 $\frac{1}{2}$ d. | 7. £3 3s. 11 $\frac{9}{16}$ d. |
| 2. £1 5s. 0d. | 8. £307 10s. 5 $\frac{3}{4}$ d. |
| 3. £43878 0s. 0d. | 9. £1150 17s. 1 $\frac{1}{8}$ d. |
| 4. £99 18s. 7 $\frac{67}{85}$ d. | 10. £17 7s. 7 $\frac{37}{85}$ d. |
| 5. £23 9s. 4 $\frac{98}{100}$ d. | 11. £36 2s. 5 $\frac{33}{85}$ d. |
| 6. £347 17s. 10 $\frac{11}{100}$ d. | 12. £2195 17s. 11 $\frac{3}{5}$ d. |

Ex. XLIX. (p. 54.)

- | | | |
|------------------------------|---------------------------------|--|
| 1. 5 yrs. | 9. £560. | 17. £4331 5s. |
| 2. 17 yrs. | 10. 3 $\frac{533}{387}$ yrs. | 18. £3054 5s. |
| 3. 13 $\frac{1}{2}$ yrs. | 11. 3 $\frac{1}{4}$ per cent. | 19. £1050; 4 per cent. |
| 4. 3 $\frac{1}{4}$ per cent. | 12. £879 2s. 5 $\frac{1}{4}$ d. | 20. £13333 6s. 8d. |
| 5. 3 $\frac{1}{4}$ per cent. | 13. 3 $\frac{3}{4}$ per cent. | 21. The latter. |
| 6. 3 $\frac{3}{4}$ per cent. | 14. 48 yrs. | 22. 917 : 800; £6321 18s. 4 $\frac{89}{11}$ d. |
| 7. £2736 10s. 6d. | 15. 1980 yrs. | 23. £639 17s. 0 $\frac{171}{1000}$ d. |
| 8. £350 10s. | 16. £246; 4 p. c. | 24. £1030 6s. 0 $\frac{6}{5}$ d. |

Ex. L. (p. 56.)

- | | |
|--------------------------------------|--|
| 1. £120. | 12. £39 0s. 0d. |
| 2. £38 14s. 10d., £1162 5s. | 13. £4 15s. 2 $\frac{1}{2}$ d.; 4s. 9 $\frac{1}{4}$ d. |
| 3. £16 17s. 6d. | 14. £4 7s. 4 $\frac{1}{8}$ d. |
| 4. £48 9s. 0d. | 15. £336 18s. 3 $\frac{1}{10}$ d. |
| 5. £245 0s. 0d. | 16. £224 17s. 10 $\frac{7}{11}$ d. |
| 6. £666 13s. 4d. | 17. £2 1s. 8 $\frac{2}{11}$ d. |
| 7. £144 11s. 6 $\frac{6}{8}$ d. | 18. £6 18s. 8 $\frac{3}{4}$ d. |
| 8. £273 15s. 0d.; 18s. | 19. 5 per cent. |
| 9. £34288 6s. 6 $\frac{54}{1017}$ d. | 20. 4 per cent. |
| 10. £46 3s. 0 $\frac{2}{3}$ d. | 21. £2 6s. 8d. |
| 11. £50 0s. 0d. | 22. 40 : 41. |

Ex. LI. (p. 57.)

- | | |
|--|-------------------------------------|
| 1. £13 3s. 9d. | 16. £141 5s. |
| 2. £408 5s. $11\frac{287}{800}d.$ | 17. £800; £2 increase. |
| 3. £1284 11s. $11\frac{223}{800}d.$ | 18. £136 5s. |
| 4. £588 5s. | 19. $89\frac{23}{80}d.$ |
| 5. £116 14s.; more. | 20. lose .018 per cent. nearly. |
| 6. £706 5s. | 21. £2 10s. more. |
| 7. £5014 18s. $6\frac{6}{7}d.$; £146 1s. $2\frac{2}{3}d.$ | 22. £25. |
| 8. £3574 4s. $10\frac{92}{100}d.$; £104 1s. $11\frac{78}{100}d.$ | 23. £3 2s. $0\frac{2}{3}d.$ |
| 9. $3\frac{3}{4}$ per cent.; £46 10s. $10\frac{1}{4}d.$ | 24. 8s. $10\frac{1}{2}d.$ loss. |
| 10. $77\frac{1}{2}$; £1542 17s. $1\frac{5}{8}d.$ | 25. £2133 6s. 8d. |
| 11. $8\frac{1}{2}$ p. c.; $3\frac{1}{2}$ p. c.; $\frac{5}{12}$ p. c. | 26. £6 5s. more. |
| 12. The 1st by £8 19s. $3\frac{2}{3}d.$ | 27. £11 16s. 8d. |
| 13. £15708 6s. 8d. | 28. £264 12s. |
| 14. £244 13s. | 29. £20000; £225000. |
| 15. The latter. | 30. £242914 19s. $7\frac{25}{24}d.$ |

Ex. LII. (p. 60.)

- | | | |
|---------------------------------|--|------------------------------------|
| 1. $10\frac{20}{107}$ per cent. | 11. $15\frac{1}{2}$ per cent. | 21. 5d. |
| 2. $2\frac{2}{3}$ per cent. | 12. 4 per cent. lost. | 22. £2 9s. $5\frac{1}{4}d.$ |
| 3. £75 13s. $7\frac{7}{11}d.$ | 13. £190 6s. $5\frac{1}{2}d.$ | 23. $18\frac{1}{2}$ gals. |
| 4. £43 10s. $8\frac{4}{5}d.$ | 14. 2s. 6d.; $4\frac{1}{2}d.$ | 24. £4000000. |
| 5. 15s. $4\frac{1}{4}d.$ | 15. £45. | 25. loses £12 13s. 9d. |
| 6. $21\frac{7}{8}$ per cent. | 16. 1 of former to 16 of latter. | 26. £1391 5s. |
| 7. $14\frac{7}{8}$ per cent. | 17. $6\frac{2}{3}d.$ or $1\frac{2}{3}$ p. c. | 27. £3 18s. |
| 8. £185. | 18. 4 per cent. loss. | 28. $4\frac{1}{2}$ lbs. |
| 9. £1000. | 19. $7\frac{5}{8}d.$ | 29. $21\frac{2797}{133}$ per cent. |
| 10. 9d. | 20. £3 12s. 6d. per qr. | 30. £1 3s. $9\frac{1}{8}d.$ |

Ex. LIII. (p. 62.)

- | | | |
|---|---|--------------------------|
| 1. 222 ft. 11' 11". | 2. 9881 ft. 3'. | 3. 147 ft. 7' 11" 7" 6". |
| 4. 37 ft. 7' 1" 6". | 5. 23 sq. yds. 2 ft. $186\frac{1}{2}$ in. | |
| 6. 9 c. yds. 2 ft. $168\frac{1}{2}$ in. | 7. 2552 c. ft. 1088 in. | |
| 8. 219 yds. 8 ft. 18 in. | 9. 101 ft. 1692 in. | |

- | | |
|--|--|
| 10. 353 sq. ft. 54 in.; 3769 c. ft. 576 in. | 11. 4482 ft. 1584 in. |
| 12. 74 sq. yds. $2\frac{2}{3}$ ft. | 13. $48\frac{2}{3}$ ft. |
| 15. 2 ft. 10' 3", 5 ft. 6' 7" 2"; 1 ft. $11\frac{1}{2}$ in. | 16. 61 ft. $2\frac{2}{17}$ in. |
| 17. $2629\frac{1}{16}$ c. ft. | 18. $21\frac{1}{2}$ in. |
| 20. 436 ft. 136 in. in floor; 4915 ft. 1080 in. in volume; 1822 ft. 92 in. in surface. | |
| 21. £242 1s. $10\frac{1}{12}$ d. | 22. £7 8s. $4\frac{1}{2}$ d. |
| 23. £6 5s. $10\frac{5}{12}$ d. | 24. £8 14s. $9\frac{3}{4}$ d. |
| 25. 83 yds. 0 ft. $10\frac{2}{3}$ in. | 26. 190 ft. 129 in.; £6 0s. $2\frac{25}{108}$ d. |
| 27. £1 12s. $4\frac{3}{4}$ d.; £7 3s. $2\frac{3}{4}$ d. | 28. 33 yds. $7\frac{1}{2}$ in.; £7 12s. $1\frac{1}{2}$ d. |
| 29. 88 yds. 2 ft. $2\frac{1}{2}$ in.; £2 15s. $5\frac{5}{108}$ d. | 30. £728 15s. |
| 31. 481 c. ft. | 32. $112\frac{1}{2}$ ft. |
| 34. 195 sq. yds. | 35. 63 ft. 120 in.; £2 2s. $6\frac{3}{4}$ d. |
| 37. 360 yds. 8 ft. 78 in.; 198 yds. 6 ft. 60 in. | 38. 182250. |
| 39. £11 9s. $7\frac{1}{2}$ d.; £14 2s. $8\frac{3}{4}$ d. | 40. £6 5s. $11\frac{1}{8}$ d. |
| 41. £23 17s. 4 d. | 42. 72 yds. 0 ft. $3\frac{1}{2}$ in.; 9s. $0\frac{22}{135}$ d. |
| 43. £19 5s. $5\frac{7}{100}$ d. | 44. 260 ft. 12 in.; £21 13s. $5\frac{3}{4}$ d. |
| 45. £8 12s. $11\frac{1}{2}$ d. | 46. 77 ft. 84 in.; £1 3s. $1\frac{3}{4}$ d. |
| 47. 480; £1 15s.; £1 4s. $5\frac{1}{4}$ d. | 48. $40\frac{15}{64}$ oz.; £1 7s. $10\frac{3}{4}$ d. |
| 49. 24000. | 50. 7 hrs. 48 mins. |

Ex. LIV. (p. 66.)

- | | | | |
|-----------------|------------------|-----------------|-----------------------|
| 1. 359. | 9. 98'01. | 17. 2'680223 +. | 25. 1'2744576 +. |
| 2. 62'41. | 10. '07403. | 18. 3080'06. | 26. $\frac{1}{16}$. |
| 3. '13125. | 11. 2'423839 +. | 19. 80'089. | 27. $55\frac{1}{2}$. |
| 4. 490'304. | 12. 1'036822 +. | 20. '01302. | 28. $6\frac{1}{15}$. |
| 5. 9'852. | 13. 3476905. | 21. '13125. | 29. '849836 +. |
| 6. '008997. | 14. '083666 +. | 22. '0950625. | 30. 2'309401 +. |
| 7. '14142136 +. | 15. '176068 +. | 23. '972435 +. | 31. 15'821504 +. |
| 8. '0316227 +. | 16. 23'181889 +. | 24. '141027 +. | |

Ex. LV. (p. 66.)

- | | | | | |
|-----------|-----------|------------|--------------------------------------|-----------|
| 1. 32. | 7. 8'75. | 13. 234. | 19. 8'099. | 25. '425. |
| 2. 503. | 8. 611. | 14. 1936. | 20. $\frac{1}{2}$; $7\frac{1}{2}$. | 26. '425. |
| 3. 203. | 9. 613. | 15. 2222. | 21. $37\frac{1}{2}$. | |
| 4. '111. | 10. 411. | 16. '1199. | 22. $\frac{9}{12}$. | |
| 5. 30'02. | 11. 612. | 17. 62'41. | 23. '69336127 +. | |
| 6. 61'4. | 12. 3'17. | 18. 4835. | 24. 1'56049 +. | |

Ex. LVI. (p. 67.)

- | | |
|--|--|
| 1. 1·14. | 2. 1·22474 +, 2·44948 +, 1·63299 +. |
| 3. 1·29099 +, 3·87298 +, 1·16189 +. | |
| 4. 2·645751 +, ·377964 +, 1·322875 +, ·881917 +. | |
| 5. 6·16, 1·232. | 6. 21 c.in. 7. 914 yds. 1 ft. 7 in.; £17 2s. 9 $\frac{1}{8}$ d. |
| 8. 99·4956 + yds. | 9. 1369 sq. ft. 10. 99 yds. |
| 11. £7 4s. 6d. | 12. 4 ft. 4 in. 13. 5·35546 + yds. |
| 14. 2112; ·0125. | 15. 81. 16. 40·52997 + ft. |
| 17. 1455 yds. | 18. 3365 yds. 19. 4044 yds. 4 ft. |
| 20. 20·87317 + ft. | 21. ·4450576 +. |

THE END.



LIST OF BOOKS

PUBLISHED BY

BELL AND DALDY, 186, FLEET STREET,

(Next St. Dunstan's Church,)

LONDON.

In course of Publication, handsomely printed in demy 8vo,

A SERIES OF

GREEK AND LATIN AUTHORS,

UNDER THE GENERAL TITLE OF

BIBLIOTHECA CLASSICA:

Edited by various hands, under the direction of GEORGE LONG, Esq., M.A., formerly Fellow of Trinity College, Cambridge, Classical Director of Brighton College; and the Rev. ARTHUR JOHN MACLEANE, M.A., Trinity College, Cambridge; Head Master of King Edward's School, Bath.

HERODOTUS. In Two Volumes, 8vo., with Notes, &c.

By the Rev. J. W. BLAKESLEY, B.D., late Fellow and Tutor of Trinity College, Cambridge. Price 32s. cloth.

The CLIO has been issued separately, price 5s.

"We are glad to observe that the excellent series, of which the volumes before us form part, still keeps up the high character it has hitherto borne. It is a gratifying proof that the regrets of some, and the exultation of others, at the supposed extinction of classical scholarship in England are premature. . . . On the whole, we have no hesitation in affirming that never has Herodotus been more carefully and efficiently edited—never has his true position as a writer been more justly determined, his accounts more thoroughly sifted, more fully compared with those of other writers and authentic monuments, and their real historical value more clearly exhibited."—*Athenæum*, May 20, 1854.

A

CICERO'S ORATIONS AGAINST VERRES ; being Vol. I. of **CICERO'S ORATIONS.** Edited by **GEORGE LONG, Esq., M.A.,** formerly Fellow of Trinity College, Cambridge. Price 16s. cloth.

"It is an edition from a master's hand, without a master's caprices. Mr. Long has been content to write for the reader without writing for himself. He has been content to give a good text without minutely describing how he settled it. He has addressed his commentary to points of real obscurity only, and has, as he avers, 'passed over no passage where he found a difficulty himself, and very few where others found a difficulty.' He has communicated the necessary assistance in few and plain words, his purpose being 'not to say all that might be said, but all that required saying;' and when the difficulty is beyond absolute solution, he fairly says so. If there are any students, teachers, or learners, who do not feel the full value of such a rule of annotation, the generation must be quite a new one. In addition to the general usefulness of such a work as this, Mr. Long has taken the opportunity of certain digressions to convey, what nobody could convey more clearly, a considerable insight into the forms and principles of procedure under the Roman law. Some of these will be interesting only to the advanced scholar, but others communicate a knowledge desirable even for ordinary classical studies, and which, after this publication, ought to be no longer rare."—*The Times*.

THE WORKS OF HORACE, with a Commentary, by the Rev. **ARTHUR JOHN MACLEANE, M.A.,** Trinity College, Cambridge. Price 18s. cloth.

"The second volume of the 'Bibliotheca Classica' is an edition of the whole works of Horace, by Mr. Macleane, one of the joint editors of the collection. It is a new text, gathered by Mr. Macleane from what he thinks the best ms. authorities. Bentley's conjectures he sedulously avoids. The notes are really valuable, partly taken up with verbal criticism, but for the most part exegetical in the best sense, and the arguments and introductions are really important aids to the comprehension of Horace. It is an excellent edition."—*Guardian*.

In the Press.

CICERO'S ORATIONS. Vol. II. By **G. LONG, Esq.**

JUVENAL AND PERSIUS, with Notes by the Rev. **A. J. MACLEANE.**

TACITUS. Vol. I. in 8vo., with Notes, &c. By **W. B. DONNE, Esq.**

In course of Publication, uniformly printed in foolscap 8vo, at a moderate price,

GRAMMAR SCHOOL CLASSICS; A SERIES OF GREEK AND LATIN AUTHORS, NEWLY EDITED, WITH ENGLISH NOTES.

THE ANABASIS OF XENOPHON, based upon the Text of BORNEMANN: with Introduction, Geographical and other Notes, Itinerary, and Three Maps compiled from Recent Surveys and other Authentic Documents. By the Rev. J. F. MACMICHAEL, B.A., Trinity College, Cambridge, Head Master of the Grammar School, Ripon. New Edition, revised, price 5s., cloth.

"No source has been neglected or overlooked from which light can be obtained; and the book will be found equally instructive to young teachers as to students. We have examined the notes in various parts of the book, and have throughout found them precise and accurate. . . . We can confidently recommend Mr. Macmichael's edition of the *Anabasis* as the best school edition that exists in the English language, and we feel certain that it will satisfy every reasonable demand that can be made."—*Classical Museum*.

M. TULLII CICERONIS CATO MAJOR SIVE DE SENECTUTE, LAELIUS SIVE DE AMICITIA, ET EPISTOLAE SELECTAE. With English Notes and an Index. By GEORGE LONG, Esq., M.A. Price 4s. 6d. cloth.

"Every page affords examples of accurate knowledge aptly applied, and proves that the editor was thinking about what the reader would be most likely to need, not about how he could display his own learning. Above all, Mr. Long has been careful to make his notes subordinate to what ought to be the chief object in studying any book—the perfect comprehension of the author's meaning, without which it is manifest that a correct knowledge of the signification of individual words or phrases is impossible."—*English Journal of Education*.

"The notes are brief, clear, and instructive; the selections judiciously made; the text carefully revised, and admirably punctuated; and the entire volume is one which the schoolboy will find invaluable, and from which even the advanced scholar may learn something."—*Weekly News*.

J. CAESARIS COMMENTARII DE BELLO GALLICO. With Notes, Preface, Introduction, &c. By GEORGE LONG, Esq., M.A. Price 5s. 6d. cloth.

"Mr. Long's name stands deservedly so high, that those who feel any interest in a work like this will need nothing more than the above brief announcement to assure them that we are likely to have here an edition of *Cæsar* surpassing and superseding any one that has previously appeared in this country. Mr. Long's connection with the work is something more than nominal. It is a *bond fide* production of his hand—not a mere make-up from foreign and other sources, labelled with his name. From first to last it bears

the impress of his vigorous and well-stored mind. We scarcely know which more to admire, the ability with which important matters are handled, or the honest pains-taking care which has been bestowed on the minutest points,—points which, though essential to accuracy, many an editor would consider beneath his notice. In the preparation of the text, Mr. Long—without compromising his own independence of mind—has availed himself of the labours of Schneller, Elberling, Herzog, Oudendorp, Clarke, Oberlin, and others. The preface contains some judicious remarks on Cæsar and his Commentaries. It is followed by an introduction intended to give to both teachers and students correct ideas of the physical character and previous history of Gallia. The notes are all that could be desired; containing valuable critical observations on various readings, explanations of difficulties, an abundance of grammatical information, illustrations from other authors, and whatever geographical, historical, and archaeological knowledge is necessary for the complete elucidation of the text. And, what is often wanting in such works, there is a vein of strong sense—the very reverse of twaddling pedantry—running through the whole, and displaying itself in the manly simplicity and force of the style. The healthy moral tone in which Mr. Long writes—his freedom from every approach to affectation, and his frank confession of difficulty—are calculated to confer scarcely less benefit on the youthful reader than the vast amount of knowledge contained in these pages.”—*Athenæum*.

QUINTI HORATII FLACCI OPERA OMNIA. With English Notes, by the Rev. A. J. MACLEANE, M.A., Head Master of King Edward's School, Bath. Price 6s. 6d. cloth.

“An abridged or rather a recast edition of Mr. Maclean's larger edition of Horace. This volume is designed for schools, and contains the broadest features of the previous edition, intended for deeper and more refined study than schoolboys will or perhaps can give. So far as regards the object of the poet, the scope of particular pieces, or the explanation of particular passages, this cheaper edition leaves nothing to be desired, as respects the understanding of Horace.”—*Spectator*, Sept. 10, 1853.

XENOPHONTIS CYROPÆDIA. With English Notes, by the Rev. G. M. Gorham, Fellow of Trin. Coll., Camb. *In the Press.*

P. OVIDII NASONIS FASTORUM LIBRI SEX. With English Notes. By F. A. PALEY, Editor of “*ÆSCHYLUS*” and “*PROPERTIUS*.” Price 5s. cloth.

“An excellent edition, founded on that of Merkel, though the editor has also availed himself of Glerig's and Keightley's. There is a good supply of Notes, which abound in critical, explanatory, and illustrative observations of a very superior cast. Mr. Paley has a strong opinion of the importance of Latin, and his mode of editing the Classical works in that language is well calculated to promote the study of it.”—*Athenæum*.

THE NEW TESTAMENT IN GREEK; based on the Text of SCHOLZ. With English Notes and Prefaces; a Synopsis of the Four Gospels; and Chronological Tables, illustrating the Gospel Narrative. Edited by the Rev. J. F. MACMICHAEL, B.A. Uniform with the “Grammar School Classics.” 730 pages. Price 7s. 6d. cloth.

“The text of Scholz has been generally followed, and great care has been taken to avoid typographical errors. It is a nicely printed volume. The Notes and Prefaces in English are short, and almost entirely exegetical. Controverted passages are, for the most part, left alone, but a great deal of real help is afforded towards the reading of the New Testament.”—*Guardian*.

AN ATLAS OF CLASSICAL GEOGRAPHY, containing 22 Maps, Engraved by W. HUGHES. Edited by GEORGE LONG. With an Index. Imperial 8vo., half-bound, price 12s. 6d.

"In the preface to his edition of *Cæsar*, Mr. Long has exhibited so complete a mastery of the geography of his subject, that, on reading his author, we always wished for his own map of the scene of operations, and our wish has now been gratified by the present publication, which, amongst others, contains of course a map of Ancient Gaul. We will not pretend that we have diligently examined every map; but we have examined quite enough to be fully justified in declaring these maps what we are conscientiously persuaded of their being—the very best of the sort that have been published in England. They are also beautifully executed, and published at a moderate price for so elaborate a work. . . . We very earnestly recommend this book of maps to every student who desires to study ancient literature with full advantage."
—*Standard*.

A GRAMMAR SCHOOL ATLAS, adapted for Junior Boys, containing 10 Maps, selected from the above. Price 5s.

THE WORKS OF VIRGIL, closely rendered into English Rhythm, and illustrated from British Poets of the 16th, 17th, and 18th centuries. By the Rev. ROBERT CORBET SINGLETON, M.A., Late Warden of St. Peter's College, Radley. In Two Volumes. Vol. I., just published, price 9s.

"For the scholastic uses designed by Mr. Singleton, his translation is well adapted. Masters and tutors will find it useful for reference, and as a groundwork for their comments and prelections. To the general reader the most acceptable part of the book will be found in the illustrative extracts of the English poets. There are in the first volume about ninety quotations from Shakespeare, and above a hundred from Spenser and many others, from Chaucer down to Thomson."—*Literary Gazette*.

SABRINAE COROLLA: a Volume of Classical Translations and Original Compositions, contributed by Gentlemen educated at Shrewsbury School. With Nine Illustrations. 8vo., cloth, 15s. Also handsomely bound in various styles.

"We cannot close this article without congratulations to the lovers of Latin scholarship on the publication of that elegant and tasteful volume, the '*Sabrinæ Corolla*.' It has happily been the means of calling forth from privacy many of Dr. Kennedy's effusions, a scholar in competition with whom no contemporary, we believe, will presume to enter the lists of classical composition. We cannot, within our limited space, attempt to do justice to the manifold beauties of his style and his extraordinary command *utriusque lingue*."—*Blackwood's Magazine*, November.

SELECTIONS FROM OVID: *Amores*, *Tristia*, *Heroides*, *Metamorphoses*; with Prefatory Remarks. 12mo., 2s. 6d. cloth.

This Selection is intended to afford an introduction, at once easy and unobjectionable, to a knowledge of the Latin language, after a boy has become well acquainted with the declension of nouns and pronouns, and the ordinary forms of verbs.

ÆSCHYLI TRAGÆDIÆ. Recensuit, emendavit, explanavit, et brevibus Notis instruxit F. A. PALEY, A.M., olim Coll. Div. Johan. Cant. 2 vols. 8vo., 1*l.* 4*s.*

	<i>s. d.</i>		<i>s. d.</i>
Orestea. (Agamemnon, Choephoroi, Eumenides)	7 6	Persæ	3 6
Agamemnon (2nd Edit.)	4 6	Prometheus Vinculus . .	4 0
Choephoroi	3 6	Septem contra Thebas, et	
Eumenides (2nd Edit.)	4 0	Fragmenta	5 6
		Supplices (2nd Edit.)	4 6

A SHORT LATIN GRAMMAR on the System of Crude Forms. By T. HEWITT KEY, M.A., F.C.P.S.; late Professor of Latin, now of Comparative Grammar, in University College, London; Head Master of University College School. Small 8vo., 3*s.* 6*d.* cloth.

LATIN ACCIDENCE. Consisting of the Forms, and intended to prepare boys for KEY'S Short Latin Grammar. The simple arrangement of the Eton Grammar has been followed as far as is consistent with the crude form system. Small 8vo., 2*s.* cloth.

RULES FOR OVIDIAN VERSE; with some Hints on the Transition to the Virgilian Hexameter, and an Introductory Preface. Edited by JAMES TATE, M.A., Master of the Grammar School, Richmond. 8vo., 1*s.* 6*d.* sewed.

THE MASTER'S LATIN VERSE BOOK. Being a Selection of Fables in Latin Prose; to which is annexed a Version in Latin Elegiac Verse, with an English Translation. Fcap. 8vo., 4*s.* cloth.

This is intended as a step between the ordinary Verse Books and Original Composition. The Latin Fable is to be given out as a subject to be turned into Latin Verse. The English may be used occasionally where the original presents any difficulty.

MATERIALS FOR LATIN PROSE. Being a Selection of Passages from the best English Authors, for Translation into Latin. By the Rev. PERCIVAL FROST, late Fellow of St. John's College, Cambridge. Fcap. 8vo., 2*s.* 6*d.*

. Masters and Tutors may procure a Key to this by direct application to the Publishers, price 4*s.*

REDDENDA; OR, PASSAGES WITH PARALLEL HINTS FOR TRANSLATION INTO LATIN PROSE AND VERSE. The latter comprising Exercises in Elegiac, Hexameter, and Alcaic Metre. By FRED. E. GRETTON, B.D., Head Master of Stamford Free Grammar School, formerly Fellow of St. John's College, Cambridge. Post 8vo., 4*s.* 6*d.* cloth.

CLASSICAL PARALLELS. By **FREDERIC E. GRETTON, B.D.**, Head-Master of Stamford Grammar School; and late Fellow of St. John's College, Cambridge. 8vo. 2s. 6d.

SELECTIONS FROM HERRICK, for Translation into Latin Verse, with a short Preface. By the Rev. **A. J. MACLEANE, M.A.**, Trinity College, Cambridge. 12mo., 2s. 6d., cloth.

"The design of the compiler of this collection apparently is, to suggest modes of thought, and to supply the means of legitimate appropriation of ideas, to young students of Latin Verse composition. Of all our English poets there is, perhaps, no one whose poetry is so much imbued with the spirit of Horace and his contemporaries as Herrick. This is a judicious selection of the pieces best suited for the purpose in view, and it is prefaced with some remarks of a general nature on versification, well calculated to assist in forming the taste and style of a learner."—*English Journal of Education*.

FLORILEGIUM POETICUM ANGLICANUM; or, Selections from English Poetry, for the use of Classical Schools, 12mo., price 3s. 6d. cloth.

"The appearance of this volume is owing to the want, which has been often and vexatiously felt, of some collection of Classical English Poetry which might furnish the younger boys of our Grammar Schools with subjects for repetition, and the elder ones with materials for translation into Latin and Greek verse."—*Preface*.

FIRST CLASSICAL MAPS; with Chronological Tables of Grecian and Roman History, and an Appendix of Sacred Geography and Chronology. Second Edition. By the Rev. **JAMES TATE, M.A.**, Master of Richmond Grammar School. Imperial 8vo., 7s. 6d. cloth.

QUINTUS HORATIUS FLACCUS, the Text, with 50 Illustrations from the Antique, drawn by **T. D. SCOTT**, and engraved on Wood. Fcap. 8vo. Price 5s.

It is well known that the Roman Poets drew many of their images from the works of art, especially Greek, with which they were so familiar. The design of this volume is to put before the readers of Horace a few good specimens of the source from which many of his expressions are no doubt derived; as well as to provide an edition of a favourite author, with appropriate and suggestive embellishments.

The Illustrations have been selected chiefly for the purpose of throwing light upon the text, and the few that have been chosen for their own artistic excellence will be found for the most part to illustrate allusions in the Author.

The Drawings have been made by Mr. T. D. Scott, and the Engravings executed under his superintendence.

The Text is printed from the editions of Mr. Maclean, published in the "Bibliotheca Classica" and "Grammar School Classics." In the notes of the former of these editions, some of the Illustrations in this volume are alluded to and explained.

CLASSICAL TABLES.

TABLES OF LATIN ACCIDENCE. By the Rev. P. FROST, M.A., late Fellow of St. John's College, Cambridge. Price 1s. cloth.

TABLES OF GREEK ACCIDENCE. By the Rev. P. FROST, M.A., late Fellow of St. John's College, Cambridge. Price 1s. cloth.

FIRST STEPS TO LATIN VERSIFICATION. Scansion and Structure of the Ovidian Verse. Folded on cloth, 1s.

PRINCIPLES OF LATIN SYNTAX. Folded on Cloth, 1s.

THE PRINCIPAL TENSES OF IRREGULAR GREEK VERBS OF FREQUENT OCCURRENCE. Folded on cloth, 1s.

THE HOMERIC DIALECT; its leading forms and peculiarities. By JAMES SKERRETT BAIRD, T.C.D., Author of a "Catalogue of Greek Verbs," &c. 8vo., cloth, 1s. 6d.

A CATALOGUE OF GREEK VERBS, Irregular and Defective, their leading Formations, Tenses in use, and Dialectic Inflections, arranged in a Tabular form, with an Appendix, containing Paradigms for Conjugation, Rules for formation of Tenses, Remarks on Augment, &c. By J. S. BAIRD. Royal 8vo., cloth, 3s. 6d.

RULES FOR THE GENDER OF LATIN NOUNS AND THE PERFECTS AND SUPINES OF VERBS; with an Appendix containing Hints on Latin Construing, for the Use of Schools. By the Rev. HERBERT HAINES, M.A., of Exeter College, Oxford, and Second Master of the College School, Gloucester. Price 1s. 6d.

DR. ROBINSON'S GREEK LEXICON TO THE NEW TESTAMENT; condensed for Schools and Students; *with a Parsing Index, containing the Words which occur, and showing their derivations.* 12mo., 573 pages, price 7s. 6d. cloth.

"Making use of the well-directed labour and well-earned fame of Dr. Robinson's 'Lexicon,' an English editor prepares this condensed work for the use of schools and students. Utility is the main object aimed at, so far as the young scholar is concerned, and therefore those parts of the original work are most fully given which are most essential to those who are only learners. Thus the inflections of all verbs, in any degree irregular, appear in their order; and in an appendix a copious parsing Index is given. For those who have only a slight knowledge of the Greek language, no lexicon will be found more useful than Robinson's Lexicon Condensed."—*Literary Gazette.*

A GREEK AND ENGLISH LEXICON TO THE NEW TESTAMENT. By JOHN PARKHURST; edited by HUGH JAMES ROSE, B.D. New edition, carefully revised, with the addition of points to the Hebrew, and an Appendix of Proper Names to the New Testament. By J. R. MAJOR, D.D., King's College. 8vo., 21s. cloth.

DOMUS PORTENTOSA; or, *The Haunted House*. By the late **THOMAS HOOD**. Literally rendered into Latin Elegiac verse, by the Rev. **PHILIP A. LONGMORE, M.A.**, late Scholar of Emmanuel College, Cambridge; incumbent of Hermitage, near Newbury, Berks. Post 8vo. 2s.

PROCEEDINGS OF THE PHILOLOGICAL SOCIETY, 1842 to 1853. 5 vols. 8vo. 2l. 10s.

The circulation of these proceedings has hitherto been limited to the Society. A few copies have been made complete by reprinting, and they are now issued to the public at the above reduced price. They contain papers by the most eminent philologists of the day.

A MANUAL OF HEBREW VERBS, to facilitate the acquirement of the various Changes in the different Conjugations of Regular and Irregular Verbs. For the Use of Beginners. 8vo., price 3s.

A PRACTICAL TREATISE ON THE CONSTRUCTION OF THE OBLIQUE BRIDGE, WITH SPIRAL AND EQUILIBRATED COURSES. By **J. BASHFORTH, M.A.**, Fellow of St. John's College, Cambridge. 8vo., cloth, 9s.

By the same Author.

A GENERAL TABLE FOR FACILITATING THE CALCULATION OF EARTHWORKS. 8vo., with a Slide Table on Wood. Price 7s. 6d.

By the same Author.

A GENERAL SHEET TABLE FOR FACILITATING THE CALCULATION OF EARTHWORKS. Price 2s. 6d.

THE ELEMENTS OF EUCLID, BOOKS I—VI., XI. (1—12), XII. (1, 2). A New Text, based on that of **SIMSON**. Edited by **HENRY J. HOSE, B.A.**, late Scholar of Trinity College, Cambridge, and Assistant Master of Westminster School. With an improved set of Figures, 12mo. price 4s., cloth; or 4s. 6d. with a graduated series of Exercises.

"Mr. Hose has supplied all that was wanting in Simson's valuable work to render the propositions complete in every part—enunciation, construction, demonstration, and corollary. All possible hypotheses are taken into account, every thing requiring proof is rigorously demonstrated, a full explanation is given of each step, and the corollaries, instead of being barely stated, are carefully worked out. Other good points about this edition are strict accuracy of expression, and distinctness of arrangement—the several parts of each proposition being clearly marked so as to facilitate the comprehension and recollection of the whole."—*Athenæum*.

* * The Exercises are sold separately, price 1s.

MANUAL OF ASTRONOMY: a Popular Treatise on Descriptive, Physical, and Practical Astronomy; with a familiar Explanation of Astronomical Instruments, and the best methods of using them. By JOHN DREW, F.R.A.S. Second Edition. With numerous illustrations, price 5s., cloth.

"A very good little manual, with a number of well-engraved maps and diagrams, and written in a brief and clear style, yet with sufficient fulness to preserve it from dryness."—*Guardian*.

THEORY OF ELLIPTIC INTEGRALS, AND THE PROPERTIES OF SURFACES OF THE SECOND ORDER, applied to the Investigation of the Motion of a Body round a Fixed Point. By the Rev. J. BOOTH, LL.D. 8vo., 7s. 6d.

ENUNCIATIONS AND COROLLARIES OF THE PROPOSITIONS OF THE FIRST SIX BOOKS OF EUCLID; together with the Eleventh and Twelfth. 18mo., sewed, 1s.

ENUNCIATIONS AND FIGURES BELONGING TO THE PROPOSITIONS OF THE FIRST SIX AND PART OF THE ELEVENTH BOOK OF EUCLID'S ELEMENTS; usually read in the Universities; prepared for Students in Geometry. By the Rev. J. BRASSE, D.D. Fifth edition, 1s., sewed.

THE SAME. Printed on loose Cards, for use in the School or Lecture Room, in a Case. 5s. 6d.

A TABLE OF ANTI-LOGARITHMS; containing to Seven Places of Decimals, natural Numbers, answering to all Logarithms from 00001 to 99999; and an improved Table of Gauss's Logarithms, by which may be found the Logarithm to the sum or difference of Two Quantities where Logarithms are given; preceded by an Introduction, containing the History of Logarithms, their Construction, and the various Improvements made therein since their invention. By HERSCHELL E. FILIPOWSKI. Second edition, revised and corrected. 8vo., cloth, 15s.

THE THEORY AND PRACTICE OF GREAT CIRCLE SAILING UNDER ONE GENERAL RULE. With Examples by the Rev. P. ROBERTSON, M.A., Examiner in Navigation and Nautical Astronomy, Aberdeen. 8vo., sewed, 1s. 6d.

THE DEVOTIONAL LIBRARY.

Edited by WALTER FARQUHAR HOOK, D.D., Vicar of Leeds.

A series of Works, original, or selected from well-known Church of England Divines, which, from their practical character, as well as their cheapness, are peculiarly useful to the Clergy for Parochial Distribution.

HELPS TO SELF-EXAMINATION, $\frac{1}{2}$ d. ORIGINAL.

THE SUM OF CHRISTIANITY, 1d. A. ELLIS.

DIRECTIONS FOR SPENDING ONE DAY WELL, $\frac{1}{2}$ d. SYNGE.

SHORT REFLECTIONS FOR MORNING AND EVENING, 2d.

PRAYERS FOR A WEEK, 2d. SOROCOLD. [SPINCKES.

The above may also be had, bound together in cloth, as "Helps to Daily Devotion," price 8d.

THE CRUCIFIED JESUS, 3d. HORNECK.

THE RETIRED CHRISTIAN, 3d. KEN.

HOLY THOUGHTS AND PRAYERS, 3d. ORIGINAL.

THE SICK MAN VISITED, 3d. SPINCKES.

SHORT MEDITATIONS FOR EVERY DAY IN THE YEAR, 2 vols. (1260 pp.), cloth, 5s. ; calf, gilt edges, 9s. ORIGINAL.

The separate Parts may be had.

THE CHRISTIAN TAUGHT BY THE CHURCH SERVICES. Cloth, 2s. 6d. ; calf, gilt edges, 4s. 6d. ORIGINAL.

The separate Parts may be had.

PENITENTIAL REFLECTIONS FOR DAYS OF FASTING AND ABSTINENCE. (Tracts for Lent.) 6d. COMPILED.

RULES FOR THE CONDUCT OF HUMAN LIFE, 1d. SYNGE.

EJACULATORY PRAYERS, 2d. A. COOK.

PASTORAL ADDRESS TO A YOUNG COMMUNICANT, $\frac{1}{2}$ d.

LITANIES FOR DOMESTIC USE, 2d. COMPILED.

FAMILY PRAYERS, cloth, 6d. ORIGINAL.

COMPANION TO THE ALTAR, cloth, 6d. UNKNOWN.

SACRED APHORISMS, cloth, 9d. BISHOP HALL.

DEVOUT MUSINGS ON THE PSALMS, Parts I. to IV., cloth, 1s. each ; or 2 vols. cloth, 5s. ORIGINAL.

THE EVANGELICAL HISTORY OF OUR LORD AND SAVIOUR JESUS CHRIST, Part I., 4d. ; Part II., 8d. ; Part III., 4d. ; or complete in cloth, 2s. ; calf, 4s. READING.

CHURCH SCHOOL HYMN BOOK, cloth, 8d. COMPILED.

PRAYERS FOR THE YOUNG, $\frac{1}{2}$ d.

* * The smaller Tracts may be had in three vols., under the titles of "Aids to a Holy Life," 2 vols., 3s. 6d. ; and "Devotions for Domestic Use," 2s.

SHORT MEDITATIONS FOR EVERY DAY IN THE YEAR. Edited by W. F. HOOK, D.D. Four vols., fcap. 8vo., large type, 14s. cloth ; 30s. morocco.

"Remarkable for the freshness and vigour which are maintained throughout."—*Christian Remembrancer*.

"All church people will hail with heartfelt welcome this beautifully printed edition of a work, the Christian piety and spiritual powers of which have been already fully appreciated and deeply felt by thousands of pious and intelligent readers."—*Church Sunday School Magazine*.

THE CHRISTIAN TAUGHT BY THE CHURCH'S SERVICES. Edited by W. F. HOOK, D.D., Vicar of Leeds. New Edition in two vols., fcap. 8vo., large type, fine paper, 10s. ; calf, old style, 14s.

"The plan is exceedingly good; the seasons of the Christian year are admirably marked by suitable contemplations."—*Christian Remembrancer*.

HOLY THOUGHTS AND PRAYERS, arranged for Daily Use on each Day of the Week, according to the stated Hours of Prayer. New Edition, with Additions. 16mo., cloth, 2s. ; calf, gilt edges, 3s.

"Well arranged; . . . and from its ecclesiastical and devotional tone is a valuable companion, especially for those whose occupation gives them opportunity for frequent religious exercises."—*Christian Remembrancer*.

VERSES FOR HOLY SEASONS. By C. F. H., Author of "Moral Songs," "The Baron's Little Daughter," "The Lord of the Forest and his Vassals," &c. Edited by W. F. HOOK, D.D., Vicar of Leeds. Third Edition. Cloth, 3s. ; morocco, 6s. 6d.

"An unpretending and highly useful book, suggestive of right thoughts at the right season."—*English Journal of Education*.

THE CHURCH SUNDAY SCHOOL HYMN BOOK. Edited by W. F. HOOK, D.D. Large paper, cloth, 1s. 6d. ; calf, 3s. 6d.

. For cheap editions of the above five books, see List of the Devotional Library.

A LETTER TO HIS PARISHIONERS ON THE USE OF THE ATHANASIAN CREED. By W. F. HOOK, D.D., Vicar of Leeds. Sixth Edition. Price 6d., or 4s. the dozen.

SERMONS suggested by the Miracles of our Lord and Saviour Jesus Christ. By W. F. HOOK, D.D., Vicar of Leeds. Two vols. fcap. 8vo., 10s. cloth. Vol. II. may be had separately to complete sets.

SERMONS ON THE DOCTRINES AND THE MEANS OF GRACE, AND ON THE SEVEN WORDS FROM THE CROSS. By GEORGE TREVOR, M.A., Canon of York. 12mo., cloth, 6s.

"A volume of excellent, sound sermons, admirably suited to answer the end for which they were preached and are published, the promotion of practical piety."—*John Bull*.

"... The sermons are manly and earnest in their resolution to look the truth in the face, and to enforce it against a prejudiced resistance, of which the writer evidently knows but too much; and they shew, moreover, a true conception of the tone by which that resistance is to be met."—*Scottish Episcopal Journal*.

PLAIN SERMONS. By the late Rev. EDWARD BLEN-COWE. Three vols. fcap. 8vo., cloth, 7s. 6d. Each sold separately.

"Their style is simple; the sentences are not artfully constructed; and there is an utter absence of all attempt at rhetoric. The language is plain Saxon language, from which 'the men on the wall' can easily gather what it most concerns them to know.

"Again, the range of thought is not high and difficult, but level and easy for the wayfaring man to follow. It is quite evident that the author's mind was able and cultivated, yet, as a teacher to men of low estate, he makes no display of eloquence or argument.

"In the statements of Christian doctrine, the reality of Mr. Blencowe's mind is very striking. There is a strength and a warmth and a life in his mention of the great truths of the Gospel, which shew that he spoke from the heart, and that, like the Apostle of old, he could say,—'I believe, and therefore have I spoken.'

"His affectionateness too is no less conspicuous: this is shewn in the gentle, earnest, kind-hearted tone of every Sermon in the book. There is no scolding, no asperity of language, no irritation of manner about them. At the same time there is no over-strained tenderness, nor affectation of endearment; but there is a considerate, serious concern about the peculiar sins and temptations of the people committed to his charge, and a hearty desire and determined effort for their salvation."—*Theologian*.

"Plain, short, and affectionate discourses."—*English Review*.

A HARMONY OF THE SACRAMENTS AND ORDINANCES OF CHRIST. A Course of Sermons, shewing how the blessedness of the Christian life consists in union with Christ through a continued use of the different means of Grace. By the Rev. C. D. KEBBEL, B.A. 12mo. cloth, 5s.

SERMONS ON THE CHRISTIAN LIFE. Preached in Margaret's Chapel, Bath, by ARTHUR J. MACLEANE, M.A., Head Master of King Edward's School, Bath. 8vo., cloth, 10s. 6d.

QUESTIONS AND ANSWERS OF THE PLAINEST KIND, ON THE NEW TESTAMENT HISTORY. By A. S. M. New Edition, 18mo., price 4d.

THE TESTIMONY OF SACRED SCRIPTURE, the

Church of the First Five Centuries, and the Reformed Church of England to the NATURE and EFFECTS of HOLY BAPTISM; together with a Short Preliminary Treatise, and an Appendix of Extracts from the Baptismal Services of the Ancient Eastern, Roman, and Gallican Churches, and also from the Baptismal Services of the Greek, Syrian, Chaldean, Armenian, and Coptic Churches. By JOHN GIBSON, B.D., formerly Fellow and Tutor of Sidney Sussex College, Cambridge, Vicar of Brent with Furneux Pelham, Herts. Price 10s. 6d.

"Mr. Gibbon, of Furneux Pelham, has printed, under the title of 'Testimony of the Church to Holy Baptism,' a very complete catena of authorities, patristic, ritual, and reformed, on the subject. The passages we observe are translated, and the work is creditable both to the scholarship and Churchmanship of the writer. It brings together into an available compass what has hitherto been found in detached and often inaccessible quarters."—*Christian Remembrancer*.

SHORT SERVICES FOR FAMILY WORSHIP. Arranged

chiefly from the Book of Common Prayer. With a Prefatory Address. By JOHN GIBSON, B.D., Vicar of Brent with Furneux Pelham, Herts; late Fellow and Tutor of Sidney Sussex College, Cambridge. 12mo., cloth, 2s.

The aim of this selection is to furnish a set of Services that will take in all the great subjects of Family Prayer, and so short that the busiest household may have time for its devout utterance. It will be found suitable for those who have hitherto neglected the duty of Family Prayer.

SACRAMENT OF RESPONSIBILITY ; or, the Testimony

of Scripture to the teaching of the Church on Holy Baptism, with especial reference to the case of Infants, and Answers to Objections. New edition, 6d.; post free, 7d.

This Tract is written to supply a want felt by the writer, as a Parish Minister, of a short treatise in which the doctrine of the Church, that all infants are regenerated in Holy Baptism, should be proved by reference to Scripture alone, and the objections commonly urged against it fully and fairly stated, and answered on principles which the objectors themselves acknowledge. It has received the approbation of seven of our own Bishops, and two of the American Episcopal Church.

THE EFFECT ON THE HUMAN HEART OF THE

DUE DISCHARGE OF THE DUTIES OF CHRISTIANITY IN A FAMILY: an Essay which gained the Denyer Theological Prize in 1855. By the Rev. JOHN SMITH GILDERDALE, M.A., Oriel College, Oxford; Assistant Master of the Forest School, Walthamstow. Fcap. 8vo. cloth, price 2s. 6d.

INFANT BAPTISM A TRUE SACRAMENT. By JOHN GIBSON, B.D., formerly Fellow and Tutor of Sidney Sussex College, Cambridge; Vicar of Brent with Furneux Pelham Herts. 3rd edition, 12mo. sewed, 4d.

THE CHURCH OF THE SCRIPTURES, AND THE DUTIES OF THE LAITY IN RELATION TO IT. Forty pages, 12mo., price 6d.

"A tract containing much sound principle against Romanism and Dissent."—*English Review*.

"An excellent compendium of arguments drawn from holy writ, by which the Church may be defended against Romanists and Dissenters."—*Parish Choir*.

THIRTY SERMONS. By the Rev. ALFRED GATTY, M.A., Vicar of Ecclesfield. Second Edition. 12mo., cloth, 8s.

A SECOND SERIES OF SERMONS. By the Rev. ALFRED GATTY, 12mo., 8s. cloth.

"We say willingly of these Sermons, what we can seldom say of sermons published at the request of parishioners, that they justify the respect paid to them, and appear to us in somewhat the same light as we should suppose they seemed to those who listened to and admired them. They are sermons of a high and solid character, and are the production of a good Churchman. They are earnest and affectionate, and follow out the Church's doctrine."—*Theologian*.

"Plain and practical, but close and scholarly discourses."—*Spectator*.

"Warm-hearted and thoughtful."—*Guardian*.

THE VICAR AND HIS DUTIES; being Sketches of Clerical Life in a Manufacturing Town Parish. By the Rev. A. GATTY, 12mo., cloth, with Frontispiece, 2s. 6d.

"It unites the merit of lively and faithful sketching, sound principles, and popular style."—*Churchman's Magazine*.

PRAYERS FOR SCHOOLS AND FAMILIES. Compiled by the Rev. A. J. MACLEANE, M.A., Head Master of the Grammar School, Bath. 8vo., 2s. cloth; 4s. calf.

A PRIEST TO THE TEMPLE; or, the Country Parson; his Character, and Rule of Holy Life. By GEORGE HERBERT. Cloth, 2s.; morocco, 4s. 6d.

THE TEMPLE, SACRED POEMS AND PRIVATE EJACULATIONS. By GEORGE HERBERT, 32mo., cloth, 2s. 6d.; morocco, 5s.; morocco extra, by Hayday, at various prices.

JOHN SELDEN. Table-talk, being the Discourses of JOHN SELDEN, or his Sense of various Matters of weight and high consequence, relating especially to Religion and the State. Royal 32mo., cloth, 2s.; morocco, 4s. 6d.; morocco extra, by Hayday, at various prices.

A SHORT EXPLANATION OF THE EPISTLES AND GOSPELS OF THE CHRISTIAN YEAR; with Questions for the Use of Schools. Edited by the Rev. C. MILLER. Royal 32mo., cloth, 2s. 6d.; calf, 4s. 6d.

"The object of this small work is to give some assistance to teachers, in imparting to children a simple and practical explanation of the Epistles and Gospels of the Christian year. Having been used with advantage in the school for which it was first drawn up, and having been approved by others who have had experience in teaching, it is now published at the suggestion of some friends who are anxious to propagate right views of education, and who wish children, whether rich or poor, to be trained up in the principles of the Church, in order that they may be 'wise' unto salvation, and do their duty in that state of life unto which the providence of God may call them."—*Preface*.

"A running commentary on the Epistles and Gospels, interspersed with short and searching questions, to bring home to the minds of the hearers the meaning of what has just been read. The whole, plain and practical, is published as 'A short Explanation of the Epistles and Gospels of the Christian Year, with Questions for the Use of Schools.'"—*Guardian*.

PRAYERS FOR CHILDREN. Contains Short and simple Prayers for daily use, as also for Sundays, Holydays, and other occasional times. The Preface contains some short and simple advice on the subject of Prayer. Part I. cloth, price 6d.

THE CHRISTIAN CHILD'S DAILY HELP. Being Part II. of Prayers for Children. Contains short and simple Religious Exercises in a form tending to lead to religious *practice*. These Exercises being adapted to the teaching of the Christian Year, it is hoped that they may awaken a love for the observance of those Holydays and Seasons by which the Church so carefully seeks to train up children for their heavenly inheritance. Cloth, price 6d.

LYRA CHRISTIANA: Poems on Christianity and the Church, Original and Selected. From the Works of ROBERT MONTGOMERY, M.A., Author of "The Christian Life," "God and Man," &c. 32mo., cloth, with a coloured Frontispiece, price 4s.; morocco, 6s. 6d.

PSALMS AND HYMNS for the Use of the Church of England at Home and in the Colonies. Selected by the Right Rev. J. W. COLENSO, D.D., Bishop of Natal. Three Editions, cloth, 6d., 1s., and 1s. 6d. respectively.

THE CHURCH HYMNAL. A Book of Psalms and Hymns, adapted for the Use of the Church of England and Ireland; arranged as they are to be sung in Churches. 24mo., cloth, 1s.; 18mo., cloth, 2s. : they may also be had with select Psalms at the same price.

This collection has been sanctioned by the authority of a large number of other clergymen, to whom the proof sheets were submitted by the Editor previous to publication, for the sake of correction and suggestion. It is now in use in several dioceses.

SYMMETRICAL PSALMODY ; or, Portions of the Psalms and other Scriptures translated into Metrical Stanzas, with corresponding Accents on corresponding Verses, for Musical Use. By the Rev. W. VERNON HARCOURT, Canon-residentiary of York Cathedral. 18mo., cloth, 1½s. 6d.

"It will be observed by a very slight inspection of the volume that Mr. Harcourt has profited by his own work, for the verses are beautifully correct in their rhythm, and supply fine specimens of versification."—*Clerical Journal*.

A BOOK OF METRICAL HYMNS, arranged according to the Services of the Church of England. By a Clergyman. 18mo., cloth, 1s.

LYRA MEMORIALIS: Original Epitaphs and Churchyard Thoughts. In Verse. By JOSEPH SNOW. With an Essay by WILLIAM WORDSWORTH (reprinted by his permission). A New Edition, remodelled and enlarged. 12mo., sewed, 1s.

"The object of Mr. Snow in the volume before us is to suggest a purer taste and a more impressive style in our churchyard memorials, and by every word and thought to point through the shadow of the tomb to the brightness and light beyond it. His work is, in truth, a treasury of feeling, and we find in its simplicity its highest merit. To the clergy this volume may be of signal use."—*Theologian*.

THE HOUSEHOLDER'S MANUAL OF FAMILY PRAYER, accompanied by Short Forms of Devotion to be said in Private, intended chiefly for the use of Persons who are engaged in the callings of Husbandry, Mechanical Arts, and Trade. By WILLIAM THORNTON, Vicar of Dodford. 12mo., cloth, 1s.

PSALMS, LESSONS, AND PRAYERS, FOR EVERY MORNING AND EVENING IN THE WEEK. Adapted to the Use of a Household. Compiled by the Rev. ERNEST HAWKINS, B.D. Second Edition. Price 9d., or cloth 1s.

The plan of this little volume will be seen at a glance. A short Service—comprising a Psalm, a Lesson from Scripture, and Prayers with

Versicles, or a Litany—is arranged for every Morning and Evening in the Week. The principal Prayers are purposely repeated, but some variety is given to each Service, by the introduction of one or more suitable Collects; while at the end will be found other Forms of Prayer, and a large number of Collects, to be used at the discretion of the master of the family. Those for the great Fasts and Festivals of the Church should be used during the *seasons* to which they belong.

“Mr. Ernest Hawkins has added to his many other services the publication of a very simple and intelligible collection of Family Prayers. Its object is to give a devotional manual which has no references or complications in it. Its arrangement is one of continuous reading, and what we much like there are prayers and intercessions for special purposes. A Manual of Prayers for Working Men, from the same author and publishers, is among the most practical and intelligible which we have seen.”—*Christian Remembrancer*.

MANUAL OF PRAYERS, for the Use more especially of Working Men and their Families. Compiled by the Rev. ERNEST HAWKINS, B.D. Third Edition. Sewed 2*d*., cloth, 4*d*.

Published for the Society for the Propagation of the Gospel in Foreign Parts.

Published Monthly, price One Halfpenny,

THE GOSPEL MISSIONARY. A Magazine of Missionary and Colonial Intelligence, addressed chiefly to the Humble Members of our Congregations, and the Children of our Schools.

Vols. I. to IV., containing Nos. i. to xlviii., cloth lettered, now ready, 1*s*. each.

. Country Subscribers are requested to order it through their Booksellers.

INDIAN MISSIONS IN GUIANA. By the Rev. W. H. BRETT. Fcap. 8vo., with Wood Engravings, price 5*s*. bound in cloth.

“There is an immensity of interesting detail throughout this volume, and we trust it may obtain a wide circulation.”—*English Review*.

THE KAFIR, THE HOTTENTOT, AND THE FRONTIER FARMER : Passages of Missionary Life from the Journals of the Venerable Archdeacon MERRIMAN. Third Thousand, with Engravings, cloth, 3*s*. 6*d*.

“We are glad to give our opinion that a more simple and yet effective record of missionary work in an English colony can hardly be found.”—*Guardian*.

THE LAND OF THE VEDA: India briefly described in some of its Aspects—Physical, Social, Intellectual, and Moral. By the Rev. PETER PERCIVAL. Crown 8vo., 524 pages, with nearly Fifty Illustrations, price 10s. 6d.

"The Land of the Veda is the title given to a series of sketches of Indian manners and literature, originally delivered in the form of lectures at St. Augustine's College, Canterbury, by the Rev. Peter Percival. It is a neatly got up volume, with many pleasing illustrations, and a very useful ethnological map, and contains a great amount of compressed information on all kinds of miscellaneous topics, likely to be very serviceable to those who are training for missionary work."—*Guardian*.

ARCHITECTURE AND ARCHÆOLOGY.

ARCHITECTURAL STUDIES IN FRANCE. By the Rev. J. L. PETIT: with Two Hundred and Forty Illustrations from Drawings by P. H. DELAMOTTE and by the Author. Impl. 8vo. 2l. 2s.

ILLUSTRATIONS OF ANCIENT ART; Four Hundred and Thirty-six Specimens of Objects discovered at Herculaneum and Pompeii. With description by the Rev. E. TROLLOPE. 4to. cloth, 25s.

"A careful, erudite, and beautiful work, and will no doubt be warmly welcomed by the students of our Universities."—*Athenæum*.

"This elegant volume aims to supply a cheaper and more accessible substitute for such elaborate works as that published by the Neapolitan Government, or those of Mazois, Donaldson, & Gell."—*Spectator*.

PROCEEDINGS OF THE ARCHÆOLOGICAL INSTITUTE, IN 1849. Communicated to the Annual Meeting of the Archæological Institute, held at Salisbury in July, 1849. 8vo. cloth with 66 illustrations, coloured and plain, 21s.

Also, separately from the above,

DIARY OF A DEAN. Being an Account of Silbury Hill, and of various Barrows and other Earthworks on the Downs of North Wilts, opened and investigated in the months of July and August, 1849. By the late JOHN MEREWETHER, D.D., F.S.A. Dean of Hereford. Thirty-five illustrations, cloth, 7s. 6d.

PROCEEDINGS OF THE ARCHÆOLOGICAL INSTITUTE AT BRISTOL, IN 1851. With numerous Illustrations. 8vo. 21s.

PROCEEDINGS OF THE ARCHÆOLOGICAL INSTITUTE, AT NEWCASTLE, IN 1853. With numerous Engravings. 2 vols. 8vo. *In the Press.*

GOTHIC ORNAMENTS: being a Series of Examples of Enriched Details and Accessories of the Architecture of Great Britain. Drawn from existing Authorities. By JAMES K. COLLING, Architect. Royal 4to., cloth, Vol. I., price 3*l.* 13*s.* 6*d.*; Vol. II., price 3*l.* 16*s.* 6*d.*

The particular object of this work is "to exhibit such a number of examples of foliage, and other ornamental details of the different styles, as clearly to elucidate the characteristic features peculiar to each period; and drawn sufficiently large in scale to be practically useful in facilitating the labours of the Architect and Artist."

The first volume consists of 104 plates; nineteen of which are highly finished in gold and colours. The second volume, of 105 plates; twenty-three of which are in gold and colours.

DETAILS OF GOTHIC ARCHITECTURE; measured and drawn from existing Examples. By JAMES K. COLLING, Architect. Royal 4to., published in monthly Nos. at 2*s.* 6*d.*
Vol. I. containing Nos. 1 to 24, 2*l.* 12*s.* 6*d.* cloth.

THE SEVEN PERIODS OF ENGLISH CHURCH ARCHITECTURE; defined and illustrated by EDMUND SHARPE, M.A., Architect, M.I.B.A. An Elementary Work showing at a single glance the different changes through which our National Architecture passed, from the Heptarchy to the Reformation. Twelve Steel Engravings and Woodcuts. Royal 8vo. 10*s.*

Each Period, except the first, is illustrated by portions of the Interior and the exterior of one of our Cathedral Churches of corresponding date, beautifully engraved on steel; so presented as to enable the Student to draw for himself a close comparison of the characteristic features which distinguish the Architecture of each of the SEVEN PERIODS, and which are of so striking and simple a nature as to prevent the possibility of mistake.

The first, or Saxon Period, contains so few buildings of interest or importance, as to render its comparative illustration unnecessary, if not impossible.

THE CHURCHES OF THE MIDDLE AGES; or, Select Specimens of Early and Middle Pointed Structures; with a few of the Purest Late Pointed Examples, illustrated by Geometric and Perspective Drawings. By HENRY BOWMAN and J. S. CROWTHER, Architects, Manchester. 2 vols. folio, 10*l.* 10*s.*; tinted, 11*l.* 11*s.*; large paper, 14*l.* 14*s.*

"We can hardly conceive any thing more perfect. We heartily recommend the Series to all who are able to patronise it,"—*Ecclesiologist*.

PARISH CHURCHES: being Perspective Views of English Ecclesiastical Structures; accompanied by Plans drawn to a Uniform Scale, and Letterpress Descriptions. By R. and J. A. BRANDON, Architects. Containing 160 Plates, 2 vols. royal 8vo. price 2l. 2s.

"I also strongly recommend Brandon's 'Parish Churches,' 'Open Timber Roofs,' and 'Analysis of Gothick Architecture.'"—*The Bishop of Fredericton's Charge*, 1848.

AN ANALYSIS OF GOTHICK ARCHITECTURE.

Illustrated by a Series of upwards of Seven Hundred Examples of Doorways, Windows, &c., accompanied with Remarks on the several Details of an Ecclesiastical Edifice. By R. and J. A. BRANDON, Architects. Two volumes, royal 4to., price 5l. 5s.

THE OPEN TIMBER ROOFS OF THE MIDDLE AGES. Illustrated by Perspective and Working Drawings of some of the best varieties of Church Roofs, with Descriptive Letterpress. By R. and J. A. BRANDON, Architects. Royal 4to., uniform with the "Analysis of Gothick Architecture." Price 3l. 3s.

The work consists of perspective views (in some instances coloured) and geometrical drawings, showing the construction and the mouldings of the various timbers, and is accompanied with descriptive letterpress.

LECTURES ON GOTHIC ARCHITECTURE, chiefly in relation to St. George's Church at Doncaster, delivered in the Town Hall there, at Christmas, 1854. By EDMUND BECKETT DENISON, M.A., one of Her Majesty's Counsel. 12mo., sewed, 3s.

RICHMONDSHIRE; its Ancient Lords and Edifices: a concise Guide to the Localities of Interest to the Tourist and Antiquary; with Short Notices of Memorable Men. By W. HYLTON LONGSTAFFE. Small 8vo., with Map, 3s. 6d.

POCKET CHART OF BRITISH ARCHITECTURE, chronologically arranged; containing Seventy-five Figures, with a Descriptive Manual. By ARCHIBALD BARRINGTON, M.D. Price, on sheet, with Manual, 2s. In cloth, with Manual, 3s.

POCKET CHART OF FOREIGN ARCHITECTURE; printed uniformly with the above, with a Descriptive Manual. By ARCHIBALD BARRINGTON, M.D. Price, on sheet, with Manual, 2s. In cloth case, with Manual, 3s.

CHRONOLOGICAL CHART OF BRITISH ARCHITECTURE; with the Genealogy and Armorial Bearings of the Sovereigns of England, and parallel Tables of the most important events in British and General History; with an Explanatory Volume. By ARCHIBALD BARRINGTON. Price, Four Sheets, in wrapper, 15s. In French Case or on Roller, 21s. Roller, varnished, 26s. The Explanatory Vol. 4s. in addition.

"The purposes of the Volume, and of the Chart which it is intended to accompany, is to enable the teacher to explain, and the learner to understand, the genealogy and succession of the Sovereigns of England, and the different styles of Ecclesiastical Architecture—two subjects of great importance. The tables of events are printed in bold letters, which readily catch the eye, and thus obviate the objection to the generality of Charts, that they present a dense mass of type, that repels rather than invites reference. The volume is written in a familiar style, and the information explicitly conveyed in the way of question and answer; so that, without the formality of set conversations, the pupil's observations and inquiries are simply anticipated and satisfied."—*Spectator*.

TABULAR DISPLAY OF BRITISH ARCHITECTURE; with a Manual for Beginners, by which the Dates of our Cathedral and other Churches may be easily known. By ARCHIBALD BARRINGTON, M.D. Price, with the Manual, on sheet, 4s. In case, 5s. On roller, 7s. 6d. On roller, varnished, 8s. 6d. The Manual by itself, 1s.

CHURCH MUSIC, ETC.

THE ORDER OF DAILY SERVICE, with the Musical Notation, as used in the Abbey Church of St. Peter, Westminster. Edited by E. F. RIMBAULT, LL.D., F.S.A., &c. 16mo., half-bound, 5s.

Used at Ely Cathedral and the Temple Church.

SELECT PSALM AND HYMN TUNES, ancient and modern, for Four Voices, with Accompaniment. By THOMAS INGRAM. Imperial 8vo, sewed, 2s. 6d.

"The selection is a judicious one, comprising only such tunes as are of a solid and devotional character."—*English Journal of Education*.

PSALTER AND CANTICLES IN THE MORNING AND EVENING SERVICES OF THE CHURCH, divided and pointed for Chanting, according to the use at the Temple Church, with Prefatory Directions, and Remarks upon the use of the Gregorian Tones in the English Church. By JOHN CALVERT. 12mo, cloth, 4s. 6d.; or strongly sewed and plainly bound in cloth, for use of choirs, 1l. 10s. per dozen.

THIRTY-TWO SELECT CHANTS; arranged for Four Voices, with Accompaniment. By T. INGRAM. Fcap. 8vo, sewed, 6d.

These Chants are printed in small music type. They may be separated and placed in a Psalter or Prayer Book, so as to be conveniently presented to the eye, along with the Psalm.

THE CHORAL RESPONSES AND LITANIES OF THE UNITED CHURCH OF ENGLAND AND IRELAND, collected from authentic sources by the Rev. JOHN JEBB, A.M., Rector of Peterstow, Herefordshire. Folio, 30s.

The present work contains a full collection of the harmonised compositions of ancient date; including nine sets of preces and responses, and fifteen litanies, with a few of the more ancient Psalm Chants. They are given in full score, and in their proper parts. In the upper part, however, the treble is substituted for the "cantus" or "medius" part; and the whole work is so arranged as not only to suit the library of the musical student, but to be adapted for use in the Choir.

In the Preface the authorities for the several documents are stated, the variations between the different copies noticed, and a succinct history given of this department of the English Choral Service since the Reformation.

THE CHORAL CLASS BOOK; or, *Singer's Manual*, for use in Churches, Families, Schools, and Choral Societies. By THOMAS INGRAM, of the Royal Academy of Music, late Conductor of the Motett Society, and Choral Master at the College, Brighton. 8vo, sewed, 2s. 6d.; cloth, 3s. 6d.

"An ably written manual for the study of those who wish to attain to the knowledge of taking a part in the psalmody and vocal music of our church. A good book of this kind has long been wanting."—*English Journal of Education*.

HYMNS AND THEIR TUNES, selected for public and Private Worship; containing 107 Hymns, with Music on the opposite page, so as to be presented to the eye simultaneously. 18mo, cloth, 3s. 6d.

PSALMS AND HYMNS for the Service of the Church.

Being a collection of Tunes, adapted to the various measures of the several selections made for the Church, and more particularly to that compiled for the use of St. Margaret's, Westminster, by the Rev. H. H. MILMAN; to which are added Chants for the Services and Responses to the Commandments, with the words at length, and a concise system of chanting to enable all the congregation to join therein, selected by J. B. SALE. 4to, 1l. 5s.

MEMOIRES OF MUSICK. By the Hon. ROGER NORTH, Attorney-General to James I. Now first printed from the original MS., and edited, with copious Notes, by EDWARD F. RIMBAULT, LL.D., F.S.A., &c. &c. Handsomely printed in 4to, half bound in morocco, with a portrait. The remaining copies are raised in price to 30s.

Abounding with interesting Musical Anecdotes; the Greek Fables respecting the origin of Music; the rise and progress of Musical Instruments; the early Musical Drama; the origin of our present fashionable Concerts; the first performance of the Beggar's Opera, &c.

MISCELLANEOUS.

EXAMPLES OF ORNAMENT. Selected chiefly from Works of Art in the British Museum, the Museum of Economic Geology, Marlborough House, and the New Crystal Palace. Drawn by FRANCIS BEDFORD, THOMAS SCOTT, and THOMAS MACQUOID; and edited by JOSEPH CUNDALL. Handsomely printed in 4to. *Nearly ready.*

This volume contains 220 different designs, 69 of which are elaborately coloured: they will be found useful for copying, and for suggestions to all classes of designers. Descriptive letter-press is attached.

HISTORY OF ENGLAND, from the INVASION of JULIUS CÆSAR to the end of the REIGN of GEORGE II. By HUME and SMOLLETT. With the Continuation from the Accession of George III. to the Accession of Queen Victoria. By the Rev. T. S. HUGHES, B.D., late Canon of Peterborough. With Historical Illustrations, Autographs, and Portraits. Also, Copious Notes, the Author's last Corrections, and Improvements. To be completed in Seventy-two Weekly Parts, Crown Octavo, with Illustrations, price One Shilling each; and in 18 Monthly Volumes, bound in cloth, price 4s. each. Vols. 1 to 16 are now ready.

HISTORY OF ENGLAND, from the ACCESSION of GEORGE III., to the Accession of QUEEN VICTORIA. By the Rev. T. S. HUGHES, B.D., late Canon of Peterborough. New edition, 7 vols., 8vo., 3l. 13s. 6d.

AN HISTORICAL SKETCH OF THE CRIMEA. By ANTHONY GRANT, D.C.L., Archdeacon of St. Alban's, and Vicar of Romford, Essex. Fcap. 8vo., cloth, with a Map, 3s. 6d.

"We are indebted to Archdeacon Grant for the best and most concise account of the Crimea we have yet seen."—*Literary Churchman*.

"The importance of the Crimea, as a territory, is more completely shown in this little volume than in any other that we have seen."—*Athenæum*.

HITHER AND THITHER ; or, SKETCHES OF TRAVEL ON BOTH SIDES OF THE ATLANTIC, containing Notes of a Visit to Madeira, Lisbon, Gibraltar, Cadiz, Malta, Rome, New York, Canada, Kingston, the Falls of Niagara, Bay of Quinté and Montreal. By REGINALD FOWLER, Esq., Barrister-at-law. In 8vo. price 10s. 6d.

"A liberal and gentlemanly tone prevails throughout. We have not noticed a single reprehensible sentiment. The views of American Society are distinguished by a quiet good sense and freedom from prejudice not often met with."—*Athenæum*.

"Mr. Fowler's Sketches are not wanting in interesting details, and the narrative is the free outpouring of a steady and careful pen."—*Literary Gazette*.

ON THE STUDY OF LANGUAGE: An Exposition of Tooke's Diversions of Purley. By CHARLES RICHARDSON, LL.D., Author of "A New Dictionary of the English Language." 12mo., cloth, price 4s. 6d.

"The judicious endeavour of a veteran philologist to extend the philosophical study of language by popularising Horn Tooke's 'Diversions of Purley.' Dr. Richardson has done good service to the study of language in this very judicious and compact recast, for the book is much more than an abridgment."—*Spectator*.

A NEW DICTIONARY OF THE ENGLISH LANGUAGE. Combining Explanation with Etymology : and Illustrated by Quotations from the best Authorities. By CHARLES RICHARDSON, LL.D. New edition, in 2 vols. 4to. *In the press*.

"We have the various acceptations, in which every word has been used by approved writers, collected by Dr. Richardson, in a Dictionary such as, perhaps, no other language could ever boast; and we have a new guide for the theory and use of languages, exemplifying his (H. Tooke's) principles by applying them to our tongue."—*Quarterly Review*. No. lxx.

"It is 'an admirable addition to our Lexicography,' supplying a great desideratum, as exhibiting the biography of each word, its birth, parentage, and education, the changes that have befallen it, the company it has kept, and the connexions it has formed, by a rich series of quotations, all in chronological order."—*Quarterly Review*. March, 1847.

"In most cases Richardson's Dictionary, the *only one* from which I can promise you effectual help, for it is the *only* English one, in which Etymology assumes the dignity of a Science, will put you in the right position for judging why the Word has been suggested to you."—*Trench on the Study of Words*.

A NEW DICTIONARY OF THE ENGLISH LANGUAGE. Combining Explanations with Etymologies. By CHARLES RICHARDSON, LL.D. 8vo., new edition, *in the press*.

"I should think a work of such merit and utility would find its way into public schools. You have rendered a service to all young students and young readers, who wish to *understand* their own language, to which beyond all doubt nothing *but simile* and secundum ever existed before."—*The late Rev. Canon Tate to the Author*.

A HISTORY OF ENGLISH RHYTHMS. By EDWIN GUEST, LL.D., F.S.A., Master of Caius College, Cambridge. Two vols. 8vo., 15s.

REMINISCENCES OF THE UNIVERSITY, TOWN, and COUNTY of CAMBRIDGE, from the Year 1780. By the late HENRY GUNNING, M.A., Senior Esquire Bedall. Second Edition, Two vols., post 8vo., price 21s.

"Some of the stories are extremely piquant, and others are interesting as pictures of manners and habits of our forefathers, and such as are not to be procured from the ordinary records of information respecting bygone times."—*Cambridge Chronicle*.

"We have preferred amusing extracts in such as we have taken from Mr. Gunning's 'Reminiscences;' but let not the reader suppose that there is not also grave information in them. The volumes contain interesting notices of many very distinguished characters connected with the period they describe, and with whom the author was personally acquainted."—*Examiner*.

POETRY OF THE YEAR: Passages from the Poets, descriptive of the Seasons, with Twenty-Two Coloured Illustrations from Drawings by the following eminent Artists:—T. Creswick, R.A.; C. Davidson; W. Lee; J. Muller; E. Duncan; Birket Foster; D. Cox; H. Le Jeune; W. Hemsley; C. Branwhite; J. Wolf; C. Weigall; Harrison Weir; R. R.; E. V. B.; Lucette E. Barker. Small 4to., handsomely bound in cloth, 25s., morocco 35s., large paper 2l. 2s., morocco 2l. 12s. 6d.

"Trying the volume before us by its own pretensions, it may be pronounced as excellent on the whole,—a welcome specimen of the progress made in coloured book-illustration, and a tasteful evidence of what our English designers can do in illustration of Thomson, Bloomfield, Cowper, Clare, Hemans, Tennyson, and other of our poets."—*Athenæum*.

SHADES OF CHARACTER; or, The Infant Pilgrim. By the late Mrs. WOODROOFFE. Sixth Edition. 2 vols. 12mo., cloth, 12s.

By the same,

THE HISTORY OF MICHAEL KEMP, THE HAPPY FARMER'S LAD, A Tale of Rustic Life. Seventh Edition. 12mo., cloth, 4s.

MICHAEL THE MARRIED MAN. A Sequel to the above. *New edition nearly ready.*

COTTAGE DIALOGUES; or, Characters and Scenes in Rural Life. *New edition preparing.*

THE WIDOW'S RESCUE; SELECT EULOGIES; SCHOOLED OR FOOLED, a Tale; with other Literary Recreations. Collected and Recollected by Sir FORTUNATUS DWARRIS, Knt., B.A., F.R.S., F.S.A. 12mo, cloth, 5s.

A POETRY BOOK FOR CHILDREN, Illustrated with Thirty-three highly finished Engravings, by C. W. Cope, R.A., A. Helmsley, S. Palmer, F. Skill, G. Thomas, and H. Weir, price 2s. 6d.

THE FAIRY GODMOTHERS AND OTHER TALES. By Mrs. ALFRED GATTY, with Illustrations. Small 8vo, cloth, 4s. 6d.

PARABLES FROM NATURE. By Mrs. ALFRED GATTY. With four Illustrations. 16mo. cloth, price 1s. 6d.

THE ENGLISH GENTLEMAN: his Principles, his Feelings, his manners, his Pursuits. 12mo, sewed, 1s.; calf or morocco, 4s. 6d.

"We like him so well as to wish heartily we might meet many such."—*Theologian*.

"The object of the first of the four essays is to form the principles of a gentleman on a Christian standard. In the other three subjects, of feelings, manners, and pursuits, the views, though strict, are of a more worldly kind."—*Spectator*.

THE RICHES OF POVERTY. A Tale. By Mrs. ECCLES. In Fcap. 8vo, Price 5s.

"A sound and intelligent book. We can conscientiously recommend it. We have gone through it with interest, and are perfectly certain that those of our readers who may peruse it, especially such as have children, will thank us for drawing attention to a work so innocently amusing and pleasantly instructive. We have no hesitation in pronouncing it one of the best works of its kind."—*Churchman's Magazine*.

THE HAYMAKERS' HISTORIES. Twelve Cantos in Terza Rima. By RUTHER. 12mo, price 4s.

"This is a scholarly little book, sweet as a meadow at haytime, and full of summer influences. We confess this little volume excites our curiosity; and as to the writer, the skill with which the metre is carried through, the almost immaculate correctness of the rhymes, and the equality of strength which pervades the whole, would indicate a poet of some standing, although the style resembles none that we remember. Really, an imitation of some of Crabbe's works becomes in his hands a poem as dainty and fanciful as the garden scenes of Queen Piametta in the 'Decamerone.'"—*Athenaeum*.

"Many a faithful miniature of healthy rustic life."—*Westminster Review*.

"The bard often rises to the fervour and dignity of a true poet of nature and the heart."—*Dublin Advertiser*.

LYRIC NOTES ON THE RUSSIAN WAR, by the same Author, 12mo., cloth, 1s.

THE ENGLISH JOURNAL OF EDUCATION, specially designed as a Medium of Correspondence among the Heads of Training Colleges, Parochial Clergymen, and all Promoters of sound Education, Parents, Sponsors, Schoolmasters, Pupil Teachers, Sunday Teachers, &c. Published Monthly, price 6d. ; Stamped, 7d. ; or in advance, 6s. 6d. a year. A few sets have been made up, and may be had in eight volumes, price £3. May be ordered of all Booksellers or Newsmen, or will be sent direct by post on receiving a Post-office order, for a Year, 6s. 6d. A Specimen Number on receipt of seven stamps.

. This periodical has now been published during eight years, and has a wide and increasing circulation amongst Clergymen and Teachers.

AN INDEX TO FAMILIAR QUOTATIONS. Selected principally from British Authors, with parallel passages from Various Writers, Ancient and Modern. By J. C. GROCOTT, Attorney-at-Law. 12mo, cloth, 3s. 6d.

THE HOUSEKEEPING BOOK ; or, FAMILY LEDGER, on an improved principle, by which an exact account can be kept of income and expenditure, suitable for any year, and may be begun at any time. By Mrs. HAMILTON. 8vo, cloth, 1s. 6d.

"The simplest and shortest method of a weekly account of housekeeping expenses that we have met with. The results are clearly ascertainable at any time. Some very sensible advice to young housekeepers is affixed."—*Spectator*.

A PRACTICAL SYNOPSIS OF ENGLISH HISTORY ; or, A General Summary of Dates and Events, for the use of Schools and Private Families. By ARTHUR BOWES. Second Edition, 8vo, cloth, 2s.

THE MANUAL OF BOOK-KEEPING ; or, Practical Instructions to the Manufacturer, Wholesale Dealer, and Retail Tradesman, for Keeping and Balancing their Books in an easy and simple manner, with an Engraving illustrating the connection of the various books with each other. By an experienced Clerk. New edition, 12mo, 4s.

"Rather an ingenious attempt to attain a chief result of double entry, by an extension of the system of single entry, intended chiefly for retail dealers and those who do not or cannot employ a book-keeper. Each person must, of course, apply the system for himself, modifying the theory to his own case; and by a close attention to the book, he may be able sufficiently to master its principles to do so."—*Spectator*.

SETS OF ACCOUNT BOOKS, Ruled according to this system, for Merchants and Retail Dealers, at various prices from 3l. 3s. upwards, may be had of the Publishers.

THE EXECUTOR'S ACCOUNT BOOK, with Short Practical Instructions for the guidance of Executors. By a Solicitor. Folio, cloth, 4s.

. The Forms may be had without the Instructions, for the purpose of Probate. Price 2s. 6d.

RUDIMENTARY ART INSTRUCTION for ARTIZANS and Others, and for Schools. By JOHN BELL, Sculptor. Prepared at the request of the Society of Arts.

MANUAL 1.—FREE-HAND OUTLINE, Part 1—Outline from Outline, or from the Flat. With One Hundred Illustrations. Price 3s.

MANUAL 2.—FREE-HAND OUTLINE, Part 2—Outline from Objects, or from the Round. With Sixty Illustrations, price 4s.

"The rules for plumbing and the elements of perspective are very graphic, and are lucidly given."—*Athenæum*.

THE FIRST BOOK OF THE PIANOFORTE, with Exercises on Fingering and Questions. By E. F. RIMBAULT. 1s. 6d.

"An admirable little manual, embodying in as small a space as possible, consistent with completeness, a comprehensive outline of all the elements of modern pianoforte-playing. The editor has shown good judgment in excluding the question-and-answer form in which most of the treatises of the kind are written, for the old method certainly tended to put that which ought to be an agreeable introduction to one of the most delightful arts too much in the shape of a task and a work of dry labour. A number of examination questions are, however, added at the end, with references to the page in the body of the work where the subject will be found fully explained, which will no doubt satisfy those who think differently, while it will enable those who are less accustomed to tuition to examine young beginners in a progressive and perspicuous manner."—*Guardian*.

SELECTIONS FROM PERCY'S RELIQUES AND EVANS'S OLD BALLADS, suitable for committing to Memory, for Translation, and for purposes of Criticism. By the Rev. HENRY TRIPP, M.A., Fellow of Worcester College, Oxford. 12mo, cloth, 2s. 6d.

"The selection has been made with good taste and judgment."—*Christian Remembrancer*.

"Your particularly useful little reprint has pleased me much. It is well selected, well edited, well printed—just what was wanted."—*From the Rev. J. D. Collis, M.A., Head-Master of Bromsgrove School.*

THE BELL: its Origin, History, and Uses. By the Rev. ALFRED GATTY, Vicar of Ecclesfield. Second Edition, with Illustrations, 12mo, 3s. cloth.

"A new and revised edition of a very varied, learned, and amusing essay on the subject of bells."—*Spectator*.

THE FIRST BOOK OF BOTANY, according to the System of Decandolle. By Mrs. LOUDON, Author of "Instructions in Gardening," &c. 30 woodcuts. Second Edition, 18mo, cloth, 1s.

HISTOIRE DE FRANCE, DEPUIS LES GAULES JUSQU'AU 1^{ER} JANVIER, 1850. Avec des Notes Pour la Traduction en Anglais. Ouvrage destine aux Maisons d'Education des deux Sexes. Par A. R. DE MONTARCIS et S. A. MAYEUR, Professeurs de Francais et D'Histoire. Crown 8vo, price 3s. 6d., neatly bound in cloth.

A SHORT AND EASY ACCESS TO THE FRENCH LANGUAGE, preceded by a Practical Treatise on French Pronunciation, and combining all the advantages of Grammars, Exercises, and Dialogues. For Self-Instruction and the use of Schools. By F. L. MURGEAUD, late Professor of French at Cheltenham College. Third Edition, revised and enlarged, by S. A. MAYEUR, French Master of the Stepney Grammar School, in union with King's College, London. Price 4s.

AVENTURES DE TELEMAQUE, par FENELON, with Notes by C. J. DELILLE, Professor at Christ's Hospital and the City of London School. 12mo, 4s. 6d. This is the first of a Series of Foreign Classics, uniform in size and plan with the Grammar School Classics.

"It is quite a rarity to meet with notes on modern foreign authors conveying so much explanatory information in so small a space, and such excellent renderings of idiomatic passages, which, even if easy to translate word for word, are not so easy to put into good English."—*Athenæum*.

HISTOIRE DE CHARLES XII., par VOLTAIRE. With English Notes, by L. DIREY. *In the Press*.

THE YOUNG LADY'S SCHOOL RECORD. A Register of Studies and Conduct for Half a Year, on a new plan. 8vo, 6d.

A HAND-BOOK FOR WESTMINSTER ABBEY, with Fifty-six Embellishments on Wood, engraved by Ladies, four Etchings by D. Cox, Jun., an Illuminated Title representing the Arcades in the Chapter House, and a Specimen of the Encaustic Tiles. By FELIX SUMMERLY. 12mo, cloth extra, 7s. Boards, 6s. Cheap Editions, 6d. and 8d.

"A volume got up in excellent taste, and written in a right spirit; critical so far as criticism could be allowed, but always suggestive, and testing opinions by reference to principles. As if to perfect the interest of the work, its fifty-six illustrative engravings have all been executed by women; and some amateurs, Lady Calcott and Lady Palgrave amongst others, have gracefully contributed drawings, and thus associated their names with their sister artists. The work is professedly a guide-book, and excellent in its way; but it is also a handsome volume for a drawing-room table, and worthy an honoured place on every lady's library-shelves."—*Athenæum*.

HAND-BOOK TO HAMPTON COURT PALACE. Being a Guide to the Architecture, Tapestries, Paintings, Gardens, and Grounds of Hampton Court; with numerous Embellishments on Wood, engraved by Ladies; and Plans of the Palace and Grounds, from Official Surveys. By FELIX SUMMERLY. New Edition, numerous illustrations, 1s.

"Decidedly the best popular guide to the picturesque beauties of Hampton Court of any extant. The writer possesses a discriminating judgment in matters of art, and a keen relish for the beauties of nature; and the circulation of this pretty little book will contribute to the enjoyment of the visitors, and the improvement of public taste."—*Spectator*.

DAY'S EXCURSIONS TO ERITH, ROCHESTER, AND COBHAM, in Kent, with Illustrations and Map; a Catalogue of the Pictures at Cobham Hall, and an Appendix containing the Inscriptions on the Brasses in Cobham Church, taken from Weever, with additions and corrections. By FELIX SUMMERLY. 12mo, 1s.

HAND-BOOK OF THE NATIONAL GALLERY. By FELIX SUMMERLY. With Fifty Illustrations drawn expressly from the originals by Messrs. John James and William Linnell. 12mo, sewed, cheap edition, 6d.

The representations in this edition of the National Gallery have been limited to the smallest practicable scale, varying somewhat according to the character of the pictures. The aim has been to give the general character and feeling of the originals, avoiding as of secondary importance the "finish" of modern engravings. They are essentially painters' woodcuts, and in that respect their merits are analogous to those of painters' etchings. They have been pronounced by the highest judges to be really excellent works of Art, of their class.

A few copies of the early edition, best impressions. Price 1s. sewed.

"Learned, chatty, useful."—*Athenæum*.

Every SATURDAY, Foolsap 4to., price 4d.; or stamped, 5d.

NOTES AND QUERIES;

A MEDIUM OF INTERCOMMUNICATION FOR LITERARY MEN, ARTISTS,
ANTIQUARIES, GENEALOGISTS, PHOTOGRAPHERS, &c.

NOTES AND QUERIES will, it is believed, be found to bring before the general reader every week a vast amount of curious and interesting information. It was established for the purpose of furnishing to all lovers of Literature a COMMONPLACE-BOOK, in which they might, on the one hand, record for their own use and the use of others those minute facts—those elucidations of a doubtful phrase, or disputed passage—those illustrations of an obsolete custom—those scattered biographical anecdotes, or unrecorded dates—which all who read occasionally stumble upon; and, on the other, of supplying a medium through which they might address those Queries, by which the best informed are sometimes arrested in the midst of their labours, in the hope of receiving solutions of them from some of their brethren. The success which has attended this endeavour to supply a want long felt by literary men is rendered manifest by the necessity of permanently enlarging the Paper from 16 to 24 pages.

. For opinions of *The Quarterly Review*, *Athenæum*, *Examiner*, *Literary Gazette*, *Spectator*, *Dublin Review*, &c., as to the utility, &c., of NOTES AND QUERIES, see Prospectus; which may be had of the publisher, and contains also a list of distinguished Contributors, and of the various popular subjects treated by them.

A Specimen Number sent on receipt of five postage stamps.

NOTES AND QUERIES

is also issued in Monthly Parts, for the convenience of those who may either have a difficulty in procuring the unstamped Weekly Numbers, or may prefer receiving it monthly: and is also published in Half-Yearly Volumes, each with very copious Index.

Price 10s. 6d. cloth boards.

1855.

List of Books

PUBLISHED BY

DEIGHTON, BELL & CO.,

(AGENTS TO THE UNIVERSITY,)

CAMBRIDGE.


THEOLOGY.

RATIONAL GODLINESS. Sermons, Explanatory and Practical. Preached at Cambridge and Lampeter, by R. WILLIAMS, B.D., Fellow of King's College, Cambridge, and Professor of Hebrew, Lampeter. Crown 8vo. 10s. 6d.

The BENEFIT of CHRIST'S DEATH: probably written by AONIO PALMARIO: reprinted in Facsimile from the Italian Edition of 1543; together with a French Translation printed in 1551; from Copies in the Library of St. John's College, Cambridge. To which is added, an English Version made in 1548, by EDWARD COURTENAY, Earl of Devonshire, now first edited from a MS. preserved in the Library of the University of Cambridge. With an Introduction, by CHURCHILL BABINGTON, B.D., F.L.S., Fellow of St. John's College, Cambridge, and Member of the Royal Society of Literature.

Square Crown 8vo. 7s. 6d.

An INTRODUCTION to the STUDY of the OLD TESTAMENT. By A. BARRY, M.A., Head Master of the Grammar School, Leeds, and late Fellow of Trinity College, Cambridge. *Preparing.*



By the Rev. H. GOODWIN, M.A.,

*Late Fellow of Gonville and Caius College, Minister of St. Edward's, Cambridge,
and Hulsean Lecturer.*

CHRIST IN THE WILDERNESS. Four Sermons
Preached before the University in the month of February 1855.
12mo. 4s.

FOUR SERMONS, Preached before the University of
Cambridge in the month of November 1853. 12mo. 4s.

CONTENTS.

1. The Young Man cleansing his way.
2. The Young Man in Religious Difficulties.
3. The Young Man as a Churchman.
4. The Young Man called by Christ.

PARISH SERMONS. *First Series.* New Edition. 12mo. 6s.

————— *Second Series.* New Edition. 12mo. 6s.

————— *Third Series.* New Edition. 12mo. 7s.

SHORT SERMONS at the Celebration of the Lord's
Supper. 12mo. 4s.

LECTURES upon **THE CHURCH CATECHISM.**
12mo. 4s.

A GUIDE TO THE PARISH CHURCH. Second Edi-
tion. 18mo. 3s. 6d.

The GREEK TESTAMENT: with a Critically Revised
Text; a Digest of various Readings; Marginal References to
Verbal and Idiomatic Usage; Prolegomena; and a Critical and
Exegetical Commentary. For the use of Theological Students
and Ministers. By H. ALFORD, M.A., late Fellow of Trinity
College, Cambridge. In 3 vols.

Vol. I., 2nd Edition, containing the Four Gospels, £1. 12s.

Vol. II., 2nd Edition, containing the Acts of the Apostles,
the Epistles to the Romans and Corinthians, £1. 4s.

Vol. III. preparing.

By the Rev. J. J. BLUNT, B.D.

Late Margaret Professor of Divinity.

FIVE SERMONS, Preached before the University of Cambridge.

8vo. 5s. 6d.

1. The Nature of Sin.
2. The Church of the Apostles.
3. On Uniformity of Ritual.
4. The Value of Time.
5. Reflections on the General Fast-Day (March 1847).

FOUR SERMONS, Preached before the University of Cambridge.

8vo. 5s.

1. The Church of England, Its Communion of Saints.
2. Its Title and Descent.
3. Its Text the Bible.
4. Its Commentary the Prayer Book.

FIVE SERMONS, Preached before the University of Cambridge.

8vo. 5s. 6d.

1. Tests of the Truth of Revelation.
2. Of Unfaithfulness to the Reformation.
3. On the Union of Church and State.
4. An Apology for the Prayer-Book.
5. National Reform.

BP. BUTLER'S THREE SERMONS on HUMAN NATURE, and Dissertation on Virtue. Edited by W. WHEWELL, D.D., Master of Trinity College, Cambridge. With a Preface and a Syllabus of the Work. Third Edition. Fcp. 8vo. 3s. 6d.

BP. BUTLER'S SIX SERMONS on MORAL SUBJECTS.

A Sequel to the "Three Sermons on Human Nature." Edited by W. WHEWELL, D.D., with a Preface and a Syllabus of the Work. Fcp. 8vo. 3s. 6d.

A TRANSLATION of the EPISTLES of CLEMENT of Rome, POLYCARP, and IGNATIUS; and of the Apologies of JUSTIN MARTYR and TERTULLIAN: with an Introduction and Brief Notes illustrative of the Ecclesiastical History of the First Two Centuries. By the Rev. T. CHEVALLIER, B.D., late Fellow and Tutor of St. Catharine's Hall. New Edit. 8vo. 12s.

ACADEMIC NOTES on the HOLY SCRIPTURES.

First Series. By J. R. CROWFOOT, B.D., Lecturer on Divinity in King's College, Cambridge; late Fellow and Lecturer on Divinity in Gonville and Caius College. 8vo. 2s. 6d.

A TREATISE on the EPISCOPATE of the ANTE-NICENE CHURCH, (with especial Reference to the Early Position of the Roman See). By the Rev. G. M. GORHAM, M.A., Fellow of Trinity College, Cambridge, and Crosse University Scholar. Fcap. 8vo. 3s. 6d.

A HISTORY of the ARTICLES of RELIGION. Including, among other Documents, the X Articles (1536), the XIII Articles (1538), the XLII Articles (1552), the XI Articles (1559), the XXXIX Articles (1562 and 1571), the Lambeth Articles (1595), the Irish Articles (1615), with Illustrations from the Symbolical Books of the Roman and Reformed Communions, and from other contemporary sources. By C. HARDWICK, M.A., Fellow and Chaplain of St. Catharine's Hall. 8vo. 10s. 6d.

ROMA RUIT: The Pillars of Rome Broken. Wherein all the several Pleas of the Pope's Authority in England are Revised and Answered. By F. FULLWOOD, D.D., Archdeacon of Totness in Devon. Edited, with additional matter, by C. HARDWICK, M.A., Fellow of St. Catharine's Hall, Cambridge. 8vo. 10s. 6d.

The HISTORY and THEOLOGY of the "THREE CREEDS." By the Rev. W. W. HARVEY, M.A., Rector of Buckland, Herts., and late Fellow of King's College, Cambridge. 2 vols. Post 8vo. 14s.

SERMONS FOR YOUNG MEN, preached before the University of Cambridge during the month of February 1853, by the Rev. W. W. HARVEY, late Fellow of King's College, and Rector of Buckland, Herts. 8vo. 4s.

ECCLESIAE ANGLICANÆ VINDEX CATHOLICUS, sive Articulorum Ecclesiae Anglicanae cum Scriptis SS. Patrum nova Collatio, cura G. W. HARVEY, A.M., Coll. Regal. Socii. 3 vols. 8vo. 12s. each.

APOSTOLIC MISSIONS: Five Sermons preached before the University of Cambridge in May 1852. By the Rev. W. B. HOPKINS, M.A., Fellow and Tutor of St. Catharine's Hall, and late Fellow of Caius College, Cambridge. 8vo. 5s.

SOME POINTS of CHRISTIAN DOCTRINE, considered with reference to certain Theories recently put forth by the Right Honorable Sir J. STEPHEN, K.C.B., LL.D., Professor of Modern History in the University of Cambridge. By W. B. HOPKINS, Fellow and Tutor of St. Catharine's Hall, Cambridge. 8vo. 3s. 6d.

AN HISTORICAL and EXPLANATORY TREATISE on the BOOK of COMMON PRAYER. By the Rev. W. G. HUMPHRY, B.D., late Fellow of Trinity College, Cambridge, Examining Chaplain to the Lord Bishop of London. Post 8vo. 7s. 6d.

ANNOTATIONS on the ACTS of the APOSTLES.

Designed principally for the use of Candidates for the Ordinary B.A. Degree, Students for Holy Orders, &c., with College and Senate-House Examination Papers. By T. R. MASKEW, M.A., of Sidney Sussex College, Cambridge; Head-Master of the Grammar School, Dorchester. Second Edition, enlarged.

12mo. 5s.

By **W. H. MILL, D.D.**

Late Regius Professor of Hebrew in the University of Cambridge.

SERMONS preached in Lent 1845, and on several former occasions, before the University of Cambridge. 8vo. 12s.

FOUR SERMONS preached before the University of Cambridge, on the Fifth of November, and the three Sundays preceding Advent, in the year 1848. 8vo. 5s. 6d.

An ANALYSIS of the EXPOSITION of the CREED, written by the Right Reverend Father in God, J. PEARSON, D.D., late Lord Bishop of Chester. Compiled, with some additional matter occasionally interspersed, for the use of the Students of Bishop's College, Calcutta. Third Edition, revised and corrected. 8vo. 5s.

OBSERVATIONS on the ATTEMPTED APPLICATION of PANTHEISTIC PRINCIPLES to the THEORY and HISTORIC CRITICISM of the 'GOSPEL; being the Christian Advocate's Publication 1840 to 1844. 8vo. cloth, 21s.

The Publishers have been enabled to complete a small number of copies of these publications. They are now for the first time issued in a volume, with a Preface and Analysis of the Contents.

PALMER'S ORIGINES LITURGICÆ, an Analysis of; or, Antiquities of the English Ritual, and of his Dissertation on Primitive Liturgies: for the use of Students at the Universities and Candidates for Holy Orders, who have read the Original Work. By W. BEAL, LL.D., F.S.A., Vicar of Brooke, Norfolk. 12mo. 3s. 6d.

BP. PEARSON'S FIVE LECTURES on the ACTS of the Apostles and Annals of St. Paul. Edited in English, with a few Notes, by J. R. CROWFOOT, B.D., Divinity Lecturer of King's College, Cambridge, late Fellow and Divinity Lecturer of Gonville and Caius College, &c. &c. Crown 8vo. 4s.

PHRASEOLOGICAL and EXPLANATORY NOTES on the HEBREW TEXT of the Book of GENESIS. By the Rev. T. PRESTON, M.A., Fellow of Trinity College, Cambridge. Crown 8vo. 9s. 6d.

A DISCOURSE on the **STUDIES** of the **UNIVERSITY** of **CAMBRIDGE**. By **A. SEDGWICK**, M.A., F.R.S., Fellow of Trinity College, and Woodwardian Professor, Cambridge. The Fifth Edition, with Additions and a copious Preliminary Dissertation. 8vo. 12s.

SERMONS preached in the Chapel of Trinity College, Cambridge. By **W. WHEWELL**, D.D., Master of the College. 8vo. 10s. 6d.

An ILLUSTRATION of the **METHOD** of **EXPLAINING** the **NEW TESTAMENT** by the early Opinions of the Jews and Christians concerning Christ. By the Rev. **W. WILSON**, M.A., late Fellow of St. John's Coll., Cambridge. New Edition. 8vo. 8s.

The **APOLOGY** of **TERTULLIAN**. With English Notes and a Preface, intended as an Introduction to the Study of Patristical and Ecclesiastical Latinity. Second Edition. By **H. A. WOODHAM**, LL.D., late Fellow of Jesus College, Cambridge. 8vo. 8s. 6d.

CLASSICS.

The **POLITICS** of **ARISTOTLE**; with Notes. By **R. CONGREVE**, M.A., Fellow and Tutor of Wadham College, Oxford. *Preparing.*

The **PROTAGORAS** of **PLATO**. The Greek Text. Edited, with English Notes, by **WILLIAM WAYTE**, B.A., Fellow of King's College, Cambridge, and Assistant-Master at Eton. 8vo. 5s. 6d.

A TREATISE on **HANNIBAL'S PASSAGE** of the **ALPS**, In which his Route is traced over the Little Mont Cenis. With Maps. By **R. ELLIS**, B.D., Fellow of St. John's College, Cambridge. 8vo. 7s. 6d.

DISSERTATIONS on the **EUMENIDES** of **ÆSCHYLUS**: with Critical Remarks and an Appendix. Translated from the German of **C. O. MÜLLER**. Second Edition. 6s. 6d.

PASSAGES in **PROSE** and **VERSE** from **ENGLISH** **AUTHORS** for Translation into Greek and Latin; together with selected Passages from Greek and Latin Authors for Translation into English: forming a regular course of Exercises in Classical Composition. By the Rev. **H. ALFORD**, M.A., late Fellow of Trinity College, Cambridge. 8vo. 6s.

ARUNDINES CAMI. Sive Musarum Cantabrigiensium
Lusus Canori; collegit atque edidit H. DRURY, A.M. Editio
quarta. 8vo. 12s.

DEMOSTHENES' SELECT PRIVATE ORATIONS,
after the Text of DINDORF, with the various Readings of
REISKE and BEKKER. With English Notes, by the Rev. C. T.
PENROSE M.A. For the use of Schools. Second Edition. 4s.

DEMOSTHENES DE FALSA LEGATIONE. By R.
SHILLETTO, M.A., Trinity College, Cambridge, and Classical
Lecturer at King's College. Second Edition, carefully revised.
8vo. 8s. 6d.

DEMOSTHENES, Translation of Select Speeches of; with
Notes. By C. R. KENNEDY, M.A., Trinity College, Cam-
bridge. 12mo. 9s.

ΥΠΕΡΙΔΗΣ ΚΑΤΑ ΔΗΜΟΣΘΕΝΟΥΣ. The Oration of
Hyperides against Demosthenes, respecting the Treasure of
Harpalus. The Fragments of the Greek Text, now first Edited
from the Facsimile of the MS. discovered at Egyptian Thebes
in 1847; together with other Fragments of the same Oration
cited in Ancient Writers. With a Preliminary Dissertation
and Notes, and a Facsimile of a portion of the MS. By
C. BABINGTON, M.A., Fellow of St. John's College, Cam-
bridge. 4to. 6s. 6d.

VARRONIANUS. A Critical and Historical Introduction
to the Philological Study of the Latin Language. By the Rev.
J. W. DONALDSON, D.D., Head-Master of Bury School, and
formerly Fellow of Trinity College, Cambridge. Second Edition,
considerably enlarged. 8vo. 14s.

EURIPIDIS ALCESTIS. Ad fidem Manuscriptorum
ac veterum editionum emendavit et Annotationibus instruxit
J. H. MONK, S.T.P., Græcarum Literarum apud Cantabri-
gienses olim Professor Regius. Editio Septima. 8vo. 4s. 6d.

EURIPIDIS HIPPOLYTUS CORONIFER. Ad fidem
Manuscriptorum ac veterum editionum emendavit et Annota-
tionibus instruxit J. H. MONK, S.T.P. Editio quinta, recensita
et emendata. 8vo. 5s.

EURIPIDIS TRAGÆDIÆ Priores Quatuor, ad fidem
Manuscriptorum emendatæ et brevibus Notis emendationum
potissimum rationes reddentibus instructæ. Edidit R. PORSON,
A.M., &c., recensuit suasque notulas subiecit J. SCHOLEFIELD.
Editio tertia. 8vo. 10s. 6d.

FOLIORUM SILVULA: a Selection of Passages for Translation into Greek and Latin Verse, mainly from the University and College Examination Papers; Edited by H. A. HOLDEN, M.A., Vice-Principal of Cheltenham College, Fellow and late Assistant Tutor of Trinity College, Cambridge.

Post 8vo. 7s.

By the same,

FOLIORUM CENTURÆ. Selections for Translation into Latin and Greek Prose, chiefly from the University and College Examination Papers.

Post 8vo. 7s.

SCHLEIERMACHER'S INTRODUCTIONS TO THE DIALOGUES OF PLATO. Translated from the German by W. DOBSON, M.A., Fellow of Trinity College, Cambridge.

8vo. 12s. 6d.

GREEK TRAGIC SENARII, Progressive Exercises in, followed by a Selection from the Greek Verses of Shrewsbury School, and prefaced by a short Account of the Iambic Metre and Style of Greek Tragedy. By the Rev. B. H. KENNEDY, D.D., Prebendary of Lichfield, and Head-Master of Shrewsbury School. For the use of Schools and Private Students. Second Edition, altered and revised.

8vo. 8s.

M. A. PLAUTI AULULARIA. Ad fidem Codicum qui in Bibliotheca Musei Britannici exstant aliorumque nonnullorum recensuit, Notisque et Glossario locuplete instruxit, J. HILDYARD, A.M., Coll. Christi apud Cantab. Socius. Editio altera.

8vo. 7s. 6d.

M. A. PLAUTI MENÆCHMEL. Ad fidem Codicum qui in Bibliotheca Musei Britannici exstant aliorumque nonnullorum recensuit, Notisque et Glossario locuplete instruxit, J. HILDYARD, A.M., etc. Editio altera.

8vo. 7s. 6d.

PROPERTIUS. With English Notes, a Preface on the State of Latin Scholarship, and copious Indices. By F. A. PALEY, Editor of *Æschylus*.

8vo. 10s. 6d.

CORNELII TACITI OPERA. Ad Codices antiquissimos exacta et emendata, Commentario critico et exegetico illustrata. Edidit F. RITTER, Prof. Bonnensis. 4 vols.

8vo. 1l. 8s.

A few copies printed on thick Vellum paper, imp. 8vo. 4l. 4s.

THEOCRITUS. Codicum Manuscriptorum ope recensuit et emendavit C. WORDSWORTH, S.T.P., Scholæ Harroviensis Magister, nuper Coll. SS. Trin. Cant. Socius et Academiæ Orator Publicus.

8vo. 13s. 6d.

A few copies on LARGE PAPER. 4to. 1l. 10s.

MATHEMATICS.

AN INTRODUCTION to QUALITATIVE CHEMICAL ANALYSIS, including the use of the Blow-Pipe. By G. D. LIVEING, B.A., Fellow of St. John's College, Cambridge.

Preparing.

NEWTON'S PRINCIPIA, the First Three Sections of, with an Appendix; and the Ninth and Eleventh Sections. Edited by the Rev. J. H. EVANS, M.A., late Fellow of St. John's College, and Head-Master of Sedburgh Grammar School. Fourth Edition. 8vo. 6s.

By W. WALTON, M.A.

Trinity College, Cambridge.

A COLLECTION of PROBLEMS in Illustration of the PRINCIPLES of THEORETICAL MECHANICS.

Second Edition. *Preparing.*

A COLLECTION of PROBLEMS in Illustration of the PRINCIPLES of THEORETICAL HYDROSTATICS and HYDRODYNAMICS.

8vo. 10s. 6d.

A TREATISE on the DIFFERENTIAL CALCULUS.

8vo. 10s. 6d.

PROBLEMS in Illustration of the PRINCIPLES of PLANE COORDINATE GEOMETRY.

8vo. 16s.

MECHANICS and HYDROSTATICS, the Propositions in, which are required of Questionists not Candidates for Honors, with Illustrations and Examples, collected from various sources. By A. C. BARRETT, M.A. Second Edition. *Preparing.*

The PRINCIPLES of HYDROSTATICS.

An Elementary Treatise on the Laws of Fluids and their Practical Application. By T. WEBSTER, M.A., Trinity College. Fourth Edition. *Preparing.*

By the same Author,

The Theory of the Equilibrium and Motion of FLUIDS.

8vo. 9s.

ARITHMETIC, a Familiar Explanation of the Higher Parts of, comprising Fractions, Decimals, Practice, Proportion, and its Applications, &c. With an Appendix. Designed as an Introduction to Algebra. By the Rev. F. CALDER, B.A., Head-Master of the Grammar School, Chesterfield. Second Edition. 12mo. 3s. 6d. With Answers, 4s. 6d.

By the Rev. S. EARNSHAW, M.A.

Of St. John's College, Cambridge.

DYNAMICS; or a **TREATISE on MOTION**. To which is added, a short Treatise on Attractions. Third Edition. 8vo. 14s.

A TREATISE on STATICS, containing the Theory of the Equilibrium of Forces; and numerous Examples illustrative of the general Principles of the Science. Third Edition, enlarged. 8vo. 10s.

By the Rev. T. GASKIN, M.A.

Late Fellow and Tutor of Jesus College, Cambridge.

SOLUTIONS of the GEOMETRICAL PROBLEMS proposed at St. John's College, Cambridge, from 1830 to 1846, consisting chiefly of Examples in Plane Coordinate Geometry. With an Appendix, containing several general Properties of Curves of the Second Order, and the Determination of the Magnitude and Position of the Axes of the Conic Section, represented by the General Equation of the Second Degree. 8vo. 12s.

SOLUTIONS of the TRIGONOMETRICAL PROBLEMS proposed at St. John's College, Cambridge, from 1829 to 1846. 8vo. 9s.

The GEOMETRICAL CONSTRUCTION of a CONIC SECTION, subject to five Conditions of passing through given Points and touching given Straight Lines, deduced from the Properties of Involution and Anharmonic Ratio; with a variety of General Properties of Curves of the Second Order. 8vo. 3s.

By the Rev. W. N. GRIFFIN, M.A.

Late Fellow and Tutor of St. John's College, Cambridge.

A TREATISE on the DYNAMICS of a RIGID BODY. 8vo. 6s. 6d.

SOLUTIONS of the EXAMPLES appended to a Treatise on the Motion of a Rigid Body. 8vo. 6s.

A TREATISE on OPTICS. Second Edition. 8vo. 8s.

ELEMENTARY WORKS,

By the Rev. JOHN HIND, M.A., F.C.P.S., F.R.A.S.

Late Fellow and Tutor of Sidney Sussex College, Cambridge.

[The Publishers desire to draw the attention of Teachers to this Series of Elementary Books. They are largely in use throughout the kingdom, and are specially suitable for Upper Forms and those who are preparing for the Universities. Upwards of Fifty Thousand Copies of these Works have been sold, and some of them have been translated into the languages of Portugal, Turkey, and India.]

The PRINCIPLES and PRACTICE of ARITHMETIC, comprising the Nature and Use of Logarithms, with the Computations employed by Artificers, Gagers, and Land Surveyors. Designed for the use of Students. *Seventh Edition.*

12mo. bds. 4s. 6d.

In the present treatise the Author has endeavoured to combine what is necessary of the Philosophy of the Science of Arithmetic with the practice of the Art of Numbers.

Throughout the work he has attempted to trace the source of every rule which is given, and to investigate the reasons on which it is founded: and by means of particular examples comprising nothing but what is common to every other example of the same kind, to attain in Arithmetic the kind of evidence which is relied upon in Geometry, or in any other demonstrative science.

A KEY to the ARITHMETIC, with an Appendix, consisting of Questions for Examination in all the Rules of Arithmetic. *Second Edition.* bds. 8vo. 5s. *In the Press.*

The Principles & Practice of ARITHMETICAL ALGEBRA: Established upon strict methods of Mathematical Reasoning, and Illustrated by Select Examples proposed during the last Thirty Years in the University of Cambridge. *Third Edition.* bds.

12mo. 5s.

Designed as a sequel to the *Arithmetic*, and affording an easy transition from Arithmetic to Algebra—the processes being fully exemplified from the Cambridge Examination Papers.

The ELEMENTS of ALGEBRA. *Sixth Edition,* revised, improved, and reduced in price. 8vo. 10s. 6d.

The ELEMENTS of PLANE and SPHERICAL TRIGONOMETRY, with the Nature and Properties of Logarithms and the construction and use of Mathematical Tables. *Fifth Edition.* 12mo. bds. 6s.

Designed to enable the Student to become acquainted with the principles and applications of Trigonometry, without requiring of him anything more than a knowledge of the Elements of Geometry and a facility in the common operations of Arithmetic and Algebra.

By the Rev. J. HYMERS, D.D.

Late Fellow and Tutor of St. John's College, Cambridge.

ELEMENTS of the Theory of ASTRONOMY.

Second Edition.

8vo. 14s.

A Treatise on the INTEGRAL CALCULUS.

Third Edition.

8vo. 10s. 6d.

A Treatise on the Theory of ALGEBRAICAL EQUATIONS. Second Edition.

8vo. 9s. 6d.

A Treatise on CONIC SECTIONS.

Third Edition.

8vo. 9s.

A Treatise on DIFFERENTIAL EQUATIONS, and on the Calculus of Finite Differences.

8vo. 10s.

A Treatise on ANALYTICAL GEOMETRY of THREE DIMENSIONS. Third Edition.

8vo. 10s. 6d.

A Treatise on TRIGONOMETRY.

Third Edition, corrected and improved.

8vo. 8s. 6d.

A Treatise on SPHERICAL TRIGONOMETRY.

8vo. 2s. 6d.

By W. H. MILLER, M.A.

Professor of Mineralogy in the University of Cambridge.

The Elements of HYDROSTATICS and HYDRODYNAMICS. Fourth Edition.

8vo. 6s.

Elementary Treatise on the DIFFERENTIAL CALCULUS.

Third Edition.

8vo. 6s.

A Treatise on CRYSTALLOGRAPHY.

8vo. 7s. 6d.

A TREATISE on the APPLICATION of ANALYSIS to SOLID GEOMETRY. Commenced by D. F. GREGORY, M.A., late Fellow and Assistant Tutor of Trinity College, Cambridge; Concluded by W. WALTON, M.A., Trinity College, Cambridge. Second Edition, revised and corrected.

8vo. 12s.

EXAMPLES of the PROCESSES of the DIFFERENTIAL and INTEGRAL CALCULUS. Collected by D. F. GREGORY, M.A. Second Edition, edited by W. WALTON, M.A., Trinity College.

8vo. 18s.

By the Rev. HARVEY GOODWIN, M.A.

Late Fellow and Mathematical Lecturer of Gonville and Caius College, Cambridge.

An **ELEMENTARY COURSE of MATHEMATICS**,
designed principally for Students of the University of Cambridge,
Fourth Edition. 8vo. 16s.

*** This Edition contains 100 pages of additional matter, and the price has been reduced from 18s. to 16s.

ELEMENTARY STATICS, designed chiefly for the use
of Schools. Crown 8vo. 6s.

The design of this work is to make the principles of Statics intelligible to boys who have attained a fair knowledge of Algebra and Trigonometry. The laws of Statics, the composition and resolution of forces, and the doctrine of the lever, are first deduced experimentally; and the student having been thus rendered familiar with the fundamental truths of the subject, is subsequently introduced to their mathematical demonstration. This arrangement forms the most striking peculiarity of the book. Each chapter is accompanied by an imaginary conversation between the tutor and pupil, in which the difficulties of the subject are discussed, and collateral information introduced. There is also appended to each chapter an Examination Paper of Questions upon its contents.

ELEMENTARY DYNAMICS, designed chiefly for the
use of Schools. Crown 8vo. 5s.

*** The two books bound together, 10s. 6d.

This volume is a sequel and companion to the preceding. It is written as nearly as possible upon the same principle, having appended to each chapter an imaginary conversation and a paper of Examination Questions. The three Laws of Motion are dealt with in three separate chapters; each of the earlier laws being followed out into its consequences, and illustrated by practical applications, before another is introduced. It is believed that this arrangement will be found very much to facilitate the progress of beginners. There is a chapter upon the impact of balls; and the treatise concludes with the doctrine of the simple cycloidal pendulum.

A **COLLECTION of PROBLEMS and EXAMPLES**,
adapted to the "Elementary Course of Mathematics." With
an Appendix, containing the Questions proposed during the first
Three Days of the Senate-House Examinations in the Years
1848, 1849, 1850, and 1851. Second Edition. 8vo. 6s.

ASTRONOMY, Elementary Chapters in, from the "Astro-
nomie Physique" of Biot. 8vo. 3s. 6d.

GEOMETRICAL OPTICS. From the German of Pro-
fessor SCHELLBACH. By W. B. HOPKINS, M.A., Fellow and
Tutor of St. Catharine's Hall, and formerly Fellow and Mathe-
matical Lecturer of Gonville and Caius College, Cambridge.
Demy folio, 10s. 6d.

ELEMENTS of the CONIC SECTIONS, with the Sections
of the Conoids. By the Rev. J. D. HUSTLER, late Fellow
and Tutor of Trinity College, Cambridge. Fourth Edition.
8vo. 4s. 6d.

By the Rev. M. O'BRIEN, M.A.

Professor of Natural Philosophy, King's College, London.

MATHEMATICAL TRACTS. On La Place's Coefficients; the Figure of the Earth; the Motion of a Rigid Body about its Centre of Gravity; Precession and Nutation. 8vo. 4s. 6d.

An Elementary TREATISE on the DIFFERENTIAL CALCULUS, in which the Method of Limits is exclusively made use of. 8vo. 10s. 6d.

A Treatise on PLANE COORDINATE GEOMETRY; or the Application of the Method of Coordinates to the Solution of Problems in Plane Geometry. 8vo. 9s.

A TREATISE on ALGEBRA.

By the Rev. GEORGE PEACOCK, D.D., Dean of Ely, Lowndean Professor of Astronomy, &c. Vol. I. ARITHMETICAL ALGEBRA. 8vo. 15s.

Vol. II. SYMBOLICAL ALGEBRA, and its Application to the Geometry of Position. 8vo. 16s. 6d.

SOLUTIONS of GOODWIN'S Collection of PROBLEMS and EXAMPLES. By the Rev. W. W. HUTT, M.A., Fellow and Sadlerian Lecturer of Gonville and Caius College. 8vo. 8s.

GEOMETRICAL Illustrations of the DIFFERENTIAL CALCULUS. By M. B. PELL, B.A., Fellow of St. John's College. 8vo. 2s. 6d.

TRANSACTIONS OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY. 9 vols. 4to. with Plates.

SENATE-HOUSE PROBLEMS for 1844. With Solutions, by M. O'BRIEN, M.A., Caius College, and R. L. ELLIS, M.A., Trinity College, Moderators. 4to. sewed, 4s. 6d.

A Treatise on the MOTION of a SINGLE PARTICLE, and of TWO PARTICLES acting on one another. By A. SANDEMAN, M.A., late Fellow and Tutor of Queens' College, Cambridge. 8vo. 8s. 6d.

An Elementary TREATISE on PLANE COORDINATE GEOMETRY, with its Application to Curves of the Second Order. By the Rev. W. SCOTT, Mathematical Lecturer, Sidney Sussex College, Cambridge. Crown 8vo. 5s. 6d.

By **W. WHEWELL, D.D.**

Master of Trinity College, Cambridge.

CONIC SECTIONS; their principal Properties proved Geometrically. 8vo. 1s. 6d.

An Elementary **TREATISE** on **MECHANICS**, intended for the use of Colleges and Universities. Seventh Edition, with extensive corrections and additions. 8vo. 9s.

On the **FREE MOTION** of **POINTS**, and on **UNIVERSAL GRAVITATION**. Including the principal Propositions of Books I. and III. of the Principia. The first Part of a Treatise on Dynamics. Third Edition. 8vo. 10s. 6d.

On the **CONSTRAINED** and **RESISTED MOTION** of **POINTS**, and on the Motion of a Rigid Body. The second Part of a Treatise on Dynamics. Second Edition. 8vo. 12s. 6d.

DOCTRINE of **LIMITS**, with its Applications: namely, Conic Sections; the first Three Sections of Newton; and the Differential Calculus. 8vo. 9s.

ANALYTICAL STATICS. 8vo. 7s. 6d.

MECHANICAL EUCLID, containing the Elements of Mechanics and Hydrostatics, demonstrated after the manner of Geometry. Fifth Edition. 12mo. 5s.

The **MECHANICS** of **ENGINEERING**, intended for use in the Universities, and in Colleges of Engineers. 8vo. 9s.

A **COLLECTION** of Examples and Problems in **PURE** and **MIXED MATHEMATICS**; with Answers and occasional Hints. By the Rev. A. WRIGLEY, M.A., of St. John's College, Cambridge, Mathematical Master in the Honourable East India Company's Military Seminary, Addiscombe. Third Edition, altered, corrected, and enlarged. 8vo. 8s. 6d.

MISCELLANEOUS WORKS.

PICTORIAL ILLUSTRATIONS of the **CATALOGUE** of **MANUSCRIPTS** in **Gonville and Caius College Library**. Selected by the Editor of that Work. Being Facsimiles of Illumination, Text, and Autograph, done in Lithograph, 4to. size, to be accompanied with two or three sheets of Letterpress Description in 8vo., as Companion to the published Catalogue. Price 1*l.* 4*s.*

A few Copies may be had, of which the colouring of the Plates is more highly finished. Price 1*l.* 10*s.*

TWO Introductory **LECTURES** upon **ARCHÆOLOGY**. delivered in the University of Cambridge. By the Rev. J. H. **MARSDEN**, B.D., Disney Professor of Archæology. 8vo. cloth, 2*s.* 6*d.*

CAMBRIDGE UNIVERSITY CALENDAR for 1855, (*Continued Annually.*) 12mo. cloth, 6*s.* 6*d.*

CAMBRIDGE UNIVERSITY ALMANAC for the Year 1855. Embellished with a Line Engraving, by Mr. E. RAD-CLYFFE, of a View of **TRINITY COLLEGE LIBRARY** and **ST. JOHN'S COLLEGE NEW BUILDINGS**, from a Drawing by B. RUDGE. (*Continued Annually.*) 5*s.*

GRADUATI CANTABRIGIENSES: sive Catalogus eorum quos ab anno 1760 usque ad 10^m Octr. 1846, Gradu quocunque ornavit Academia. Curâ J. ROMILLY, A.M., Coll. Trin. Socii atque Academiæ Registrarii. 8vo. 10*s.*

LECTURES on the **HISTORY** of **MORAL PHILOSOPHY** in **ENGLAND**. By W. WHEWELL, D.D., Master of Trinity College, Cambridge. 8vo. 8*s.*

MR. MACAULAY'S CHARACTER of the **CLERGY** in the latter part of the Seventeenth Century Considered; with an Appendix on his Character of the Gentry, as given in his History of England. By **CHURCHILL BABINGTON**, B.D., Fellow of St. John's College, Cambridge. 8vo. 6*s.*

Cambridge: DEIGHTON, BELL, & Co.;

London: BELL & DALDY.





